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HUMAN PROGRESS

GROUP OF INDIANS FLAKING OUT STONE IMPLEMENTS.

From a group of figures constructed by W. H. Holmes for the Field-Columbian Museum, Chicago, after an original design to be published by the Bureau of Ethnology.

SOME FIRST STEPS

IN

HUMAN PROGRESS

98679

BY

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INTRODUCTION.

THE word "anthropology" from its derivation means, of course, a discourse concerning man. It has been defined by the great French naturalist, De Quatrefages, as "the natural history of man." It is, then, scientific study of man of the same sort as the scientific study which a botanist pursues concerning plants and the zoölogist concerning animals. In its most comprehensive meaning it includes the study of the physical man and of his mental, social, and religious natures. It is a broad field; not easily limited. It includes a number of subordinate sciences, such as somatology or physical anthropology, ethnology, prehistoric archæology, and culture history. It is not the intention of the author in writing this book to discuss the whole field of anthropology, but simply to consider some points in culture history. It shall be our aim to trace simply some few of the first steps in human progress.

Primitive man, whatever his capacity for learning and achievement, faced an unknown world. He was to subdue nature; to do so he must solve many problems. If we look at the great progress and advancement which we, in America, have made within one hundred years we may see how the solution of one problem aids to solve a new problem; how the ground gained to-day serves simply as a point from which to advance to occupy new ground to-morrow. This progress is now marked and rapid; when it began it was slow and feeble.

A part of this book was originally presented in the form of lectures to a Chautauqua audience. These lectures have been

taken as a foundation; they have been expanded; new topics have been discussed. The work as a whole has been developed with the Chautauqua audience in mind. From the character of the work it has been deemed inadvisable to encumber the pages with references and notes. There are many books to which the author is indebted; there are many persons to whose inspiration and suggestion he owes much of what is here contained. The absolutely new and original content of the work either in matter or in form is small. It is believed, however, that to a certain degree the mode of treatment is fresh and somewhat original. While it is impossible to acknowledge every source from which material or suggestion has been drawn, there will be found at the close of the work a list of the books which have been found most helpful and to which the interested reader is referred for further detail and for fuller discussion.

The great importance of the study of anthropology in its various divisions is beginning to attract wide attention. But a few years since there were no institutions of learning in which the subject was really taught; to-day there are several colleges and universities in which there is a teacher of anthropology in the faculty, and there are many more where anthropology is taught as a subordinate subject by some one whose special work lies in another field. Our leading magazines devote ever greater amount of space to articles dealing with anthropological questions. Books in this field are more and more numerous; where they were counted singly a few years ago they may now be seen by dozens. The author himself has attempted to increase the public interest in this important subject by means of the *Anthropological Series* of which he is the editor, some numbers of which have already been published. This interest is hopeful. Surely there can be no more important field in which to study than the science which treats of our own kind. We may hope for better teachers, better preachers, better mission-

aries, better fathers, better mothers, when a scientific knowledge of what man has been, what he is, and what we may reasonably hope he will be, shall be common property of all intelligent people.

No one is better aware than the writer of the fact that the book is by no means complete; that there are very few lines of progress even sketched from beginning to end; that in many places there are only vague indications; that there are whole lines of study, most interesting in character, which are completely omitted. This is in part the result of limitations; it is also in part intentional. We would much rather send forth a book whose incompleteness shall exasperate to further study and reading than not. We wish to suggest, to kindle thought, to arouse interest. If this is done we shall be satisfied.

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SOME FIRST STEPS IN HUMAN PROGRESS.

CHAPTER I.

FIRE-MAKING.

The use of fire, now universal, is ancient.

It is not easy to imagine fully what man must have been without the use of fire. There is no race now known but which has this most useful servant. As far back as we can trace man's existence on the globe, almost, we find evidence that he knew and used fire. In the cave dwellings of France stones are found which show the effects of heat. The flints of Thenay, not universally accepted by scientific men as showing signs of human handiwork but claimed by some to be human relics, show the signs of fire action upon them. Yet it is certain that, although no people are now known who know not fire and although the antiquity of its use is great, there was once a time when man did not know fire either in its use or in its making.

Condition of man without fire.

Without fire man had no means of cooking his food; without it he had no convenient tool in the felling of trees or hollowing of canoes; without it he had no means of warmth in wintry weather; without it he had no protection against howling beasts and evil spirits in the darkness of the night.

Fires kindled by nature.

We may be sure that man learned what fire was and what it could do from nature-kindled fires. At times nature kindles fires. In certain regions from the mouths of volcanoes great streams of melted rock descend, and as they flow down the mountain side they set to blazing shrubs, bushes, trees, with

which they come in contact; in other districts, where long droughts prevail in summer and where the trees become dry and shriveled, a sudden tempest rises and the lightning stroke kindles the dry trunks, which burst into pillars of flame. It is certain that such fires kindled by nature would attract to a marked degree the attention of primitive man and would fill him with wonder and terror. He could not long have seen such fires without coming to look upon fire as a hungry monster, licking with its red tongue the fuel which it consumes. It would not be unnatural for him to feed the flame with fresh food. Man nurses and feeds the fire which nature kindles, and thereby in time he comes to realize its usefulness; he enjoys its warmth; he delights in finding that the terrors of the night are vanquished and he treasures the flame and keeps it burning day after day until he looks upon its extinguishment by neglect or other means as a misfortune to be carefully avoided. There are peoples who to-day seldom make fires for themselves, but who keep fire constantly fed and burning. Thus, Stewart says that certain natives of North Australia go to neighboring tribes for fresh light if theirs goes out; Angus says that West Australians do the same. It is no uncommon sight, in certain parts of the great island, for travelers in the desert to come upon a tribe migrating, and, when they do so, they find them carrying blazing torches with them that they may have fresh fires at their evening camp.

Man feeds the fire nature kindles.

Sometime or other, after having known and fed fire, the primitive man learns how to make it. If we look at the modes of making fire which prevail over the world we find three great methods widely spread: (*a*) by friction, (*b*) by percussion, (*c*) by chemical means. Although by no means the simplest or the easiest, it is perhaps true that the oldest mode of making fire is by the friction of two pieces of wood one against the other. Inasmuch as the story of progress in this direction neatly traces

Discovery of modes of fire-making.

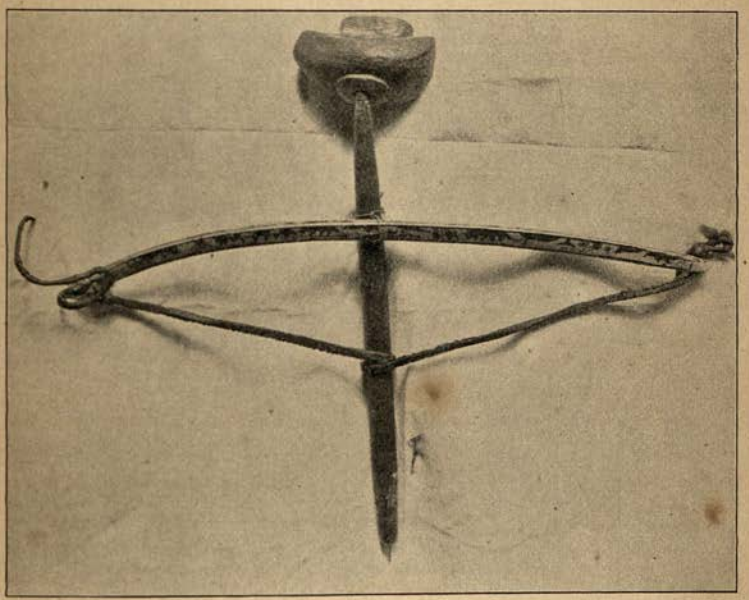

FIG. 1.—ESKIMO BOW-DRILL.

Consisting of an upper rest held between the teeth, a shaft-drill, and a bow which whirls the latter. This specimen is for drilling holes, but similar ones without the iron point were used in fire-making.

a development step by step, we shall consider the making of fire by friction at some length. Tylor has a most interesting chapter on the subject, and Mr. Hough at Washington has recently conducted experiments in the making of fire by friction until he has become a veritable artist. A very simple means of making friction-fire is found among many of the Polynesian islands and appears to be limited to that district. A stick perhaps eighteen inches or so in length, bluntly pointed at one end, is taken in the hands and rubbed rapidly back and forth in a groove in a larger piece of wood set on the ground. In a few seconds sufficient heat is generated by this process to give the spark and a fire is kindled. Visitors to the South Sea Island village on the Midway Plaisance at the Exposition at Chicago might see this rubbing out of fire performed at any time by the natives. Somewhat similar to this method of rubbing out fire by a to and fro motion of a stick in a groove is the sawing out of fire which is found among the Siamese. So far as we understand this method, a notch is made in one piece of bamboo and a second piece is cut to fit the notch and is moved rapidly across the notch back and forth, as a saw is moved, until a spark is secured.

Friction-made fire:

(*a*) Rubbing out fire;

(*b*) Sawing out fire;

Far more widely distributed is the making of fire by some mode of drilling. This is found in Australia, Tasmania, Sumatra, Kamtschatka, India, through South and West Africa, among the Guanches of the Canary Islands, among the Eskimo, among many North American Indian tribes, South Americans, old Mexicans; these indicate but a few regions which might be mentioned. Of the Australians Captain Cook said: "They produce fire with great facility and spread it in a wonderful manner; they take two pieces of dry soft wood; one is a stick about eight or nine inches long, the other piece is flat; the stick they shape into an obtuse point at one end and, pressing it upon the other, turn it nimbly, by holding it between their

(*c*) Fire-drills;

hands, shifting their hands up and then moving them down upon it, increasing the pressure. By this means they get fire in less than two minutes."

Livingstone said of the Zambesi people: "These carry on a long journey a sleeping mat and a wooden pillow, a pot and a sack of meal, a pipe and a tobacco pouch, a knife and a bow and arrow, as well as two little sticks two or three feet long in order to make fire if they are obliged to spend a night away from human dwellings. Dry wood may always be found. In one of the sticks, which has a very rough outside and a little pitch within, is a notch cut and this notched stick is laid horizontally upon a knife-blade placed on the ground. He who will make the fire squats down, and in order to hold the stick firm puts his great toes at each end. He takes the other stick, which is of very hard wood and on which a very dull point is cut, and puts it squarely in the notch. The upright stick is, like a drill, rapidly whirled to and fro between the hands and at the same time pressed firmly downward. In the course of about a minute the friction ignites a part of the pitch of the notched stick, which as glowing charcoal runs over into the knife-blade and is brought into a handful of dried grass, which by careful fanning is kindled. It is a sore task to make fire in this way, and soon raises blisters on white hands."

(*d*) Drill whirled by cord;

This simplest method of drilling for fire has in some districts been improved upon. If, instead of wearing blisters on the hands, one wraps a cord about the upright stick and then holds it at the two ends with his hands, he may, by drawing the cord first in one direction and then in the other, whirl the stick more rapidly and regularly than he could do otherwise. A second man holds the drill down with a block set against the other end. Such a method of producing fire is known among the Brahmans, Eskimo, and the Aleutian Islanders. As is easily seen, this method requires two men to do the work. Some Eskimo

have gone a step further by using a mouth-piece to steady the upper end of the revolving stick, and so dispense with the second man's services. Sir Edward Belcher in referring to this method says: "The thong being passed twice around the drill, the upper end is steadied by a mouth-piece of wood held between the teeth. . . . . Having once tried it myself I found the jar or vibration on the jaws, head, and brain quite enough to prevent my repeating it."

(*e*) The bow-drill;

Other Eskimo have still further improved the method. Instead of holding the two ends of the cord by their hands they fasten them to the ends of a stiff bow, which by its elasticity holds the cord taut. One man, taking the bow in one hand, is able to revolve the upright rapidly, while with the other hand he holds the block of wood against the upper end of the drill to steady it. In this way neither blistered hands nor jarred head-bones result from the process. The final development of the fire-drill seems to be found in the pump-drill, such as Morgan describes among the Iroquois. Here the upright stick passes through a flat piece of wood. Cords which are fastened to the end of the upright stick are also fastened to the two ends of this horizontal flat piece. If now the upright piece of wood is slowly turned, the cords wind around it near its upper end. When one now presses down upon the crossbar, the cords are untwisted and the upright stick is whirled. When the cords have been entirely unwound, the downward pressure on the crossbar is removed, and the whirling stick again winds up the cords; another downward pressure continues the rotation. A disk of wood is usually fastened to the upright stick near its lower end in order to make the whirling movement of the drill more regular by increasing the weight of the whole.

(*f*) The pump-drill;

Tylor calls attention to the brace-drill, of the Guacho of South America, which is simply a slender stick eighteen inches long. The upper end is rested against the chest while the other

(*g*) The brace-drill.

end fits into the notch in the block of wood. With the hand the stick is whirled much as a brace and bit are worked, and a spark is soon secured. So much for the different ways in which people, in the past and present, have made fire by the friction of two pieces of wood one against another.

Making fire by percussion.

The second method of making fire is by percussion. Of course this method of making fire was in use among our own ancestors not very long ago, and flints and steels are not so rare but what most people have seen them and know the method of their use. The Fuegians get a spark by striking a flint with pyrite: pyrite is also used among many of the Indians of North America, as it was among the Romans and the ancient Greeks; in fact, the word pyrite comes from the Greek word for fire and means fire-stone.

Hough says that, to get a spark, the Eskimo places the piece of pyrites on the pad held in the left hand over the curved forefinger, the large end down and the thumb set in the cup-shaped cavity at the top. The flap of the tinder-pocket is turned back and held on the forefinger under the protecting pad. The flint is held in the right hand, and by a scraping motion little pieces of pyrites at a dull red heat fall down into the tinder. The pellet that glows is transferred to the pipe or fire, and the flap of the tinder-pocket is turned down, serving to keep the tinder dry and to extinguish it if necessary.

The Alaskans strike "together two pieces of quartz rubbed with sulphur over some dry grass or moss, strewed with feathers where the sulphur falls." The West Africans lay down on their knees by a fire-stone, "took a little piece of wood in their hands, and threw sand between the stone and the wood, rubbing them so long against one another till the wood began to burn." In some parts of Southeastern Asia bamboo splints are struck together to make a spark, and in Burmah bamboo and broken china.

The third method of making fire, namely, by chemical means, is mainly the development of the present century. Various curious devices, such as the hydrogen and platinum machine of 1823, known as the Dobritzhofer's lamp, were the first experiments in this direction. In 1827 Walker's congreves, which were wooden splints coated with sulphur, tipped with sulphate of antimony, potassium chlorate, and gum, were introduced. Eighty-four of these in a box, with a folded piece of glass-paper upon which to strike them, were sold for one shilling, English money. In 1833 matches first appeared in America upon a commercial scale, and their use has grown until at present six matches a day is the average allowance for our people, and in 1881 40,000,000,000 were manufactured, as shown by the tax paid to the United States treasurer on their manufacture.

Making fire by chemical action.

In closing this chapter upon fire-making we reproduce Mr. Walter Hough's table of primitive modes of fire production: *Fire-making.*

i. Fire-making by reciprocating motion.
   1. *Simple, two-stick apparatus:* Americans, Ainu, Somalis, Kaffirs, Veddahs, Australians.
   2. *Four-part apparatus:* Eskimo, some Americans, Hindus, Dyaks.
   3. *Weighted drill,* with spindle-whorl: Iroquois, Chukchis.

ii. Fire-making by sawing.
   Malays, Burmese, etc.

iii. Fire-making by plowing.
   Polynesians, Australians, and Papuans.

iv. Fire-making by percussion.
   1. *With pyrites, or stone containing iron, and flint:* Eskimo and northern Indians of America.
   2. *With flint and steel:* general.

CHAPTER II.

FIRE-MAKING (*Continued*).

IT HAS already been stated that there is reason to believe that man first made fire by friction of two pieces of wood; it seems far simpler to think of the earliest artificial fire being produced by percussion. Primitive man in making his flint tools must often have struck out a spark by accident. This might suggest his using bits of flint as means of securing a fire when he wished it. On the other hand, it seems as if the discovery of making fire by friction of two pieces of wood were a rather difficult and unlikely thing upon which to fall by accident. If, therefore, we assume that the friction-made fire is the older, we ought to suggest reasons for such a belief.

What method of making fire is oldest?

It is important that we should have before us plainly the meaning of the expression "survival in culture." We find all about us curious customs which have no present significance, but which have come to us out of the past. For instance, why are there buttons on the sleeve of a man's coat? Why does a gentleman remove his glove when he shakes hands with a lady? There is absolutely no meaning in our present life for either of these customs, but both had reasons in the past. We may be sure that everything which man does was reasonable when it began to be done, but after it once comes to be custom it may last on indefinitely. Such a useless practice is called "a survival in culture." We may remark in passing that while survivals are found everywhere, they are most common in the operations of the two conservative factors in society—among

Survivals in culture.

women and in religion. We find, in fact, in the lives of women and in the ceremonies of religion and in the lives of the priests, great numbers of such survivals. When there are found, side by side, two ways of doing anything, one of which is convenient and in every-day use while the other is inconvenient and found in religious ceremony or among priests, we may feel quite certain that the religious form is the older usage and is a survival in culture. A friend, a Japanese, tells us that in Japan to-day every one uses matches, such as we use, except the priests in the temples, who still go on using the flint, just as they did one hundred years ago. It is an example of survival in culture among religious leaders.

The bow-drill survives in religious ceremony among Sacs and Foxes.

Some years ago it was our fortune to have frequent dealings with a little remnant of the once famous Sacs and Foxes. Perhaps four hundred of these Indians still live in central Iowa; they build their old style of houses, dress in their old garments, keep up the use of their old language, observe their old religious practices. One day in the winter lodge of a medicine man we saw some peculiar sticks hanging on the framework of his hut inside. On our asking what they were, the old man told us that he did not know—certain sign that they were in some way religious. We thereupon asked a young man of intelligence about them. He told us they were fire-sticks, and by his further explanation showed us that they were really a bow-drill. After much discussion he agreed to make us the apparatus, pledging us to secrecy, and demanding that we should bring with us the material necessary. When we made our next visit to the village we carried with us the desired wood. We made an appointment with the Indian, finding ourselves obliged to raise the already high price which he was to receive for his work; he was to come to our room at evening and there make the drill. When night came our Indian came also; to suit him we improvised curtains for the window,

locked the door, and then waited for him to proceed with his operations. Taking his great knife from his pocket, he began to whittle the stick, but at the first cut the knife fell from his grasp as if he had been paralyzed, the veins stood out upon his brow, and the great drops of sweat ran down his face. He was the picture of complete and dreadful terror. Upon inquiry he assured us that the act in which he was engaged was one of great iniquity and that the God would be angry and would punish his sacrilege. In vain I argued, stating that the God would never care. Turning almost fiercely he said: "No, not your God, but my God. I full-blooded Indian, I know."

In other words, among the Sacs and Foxes of to-day the bow-drill for making fire by friction is used only in religious rites. It is the property of the medicine man; it is touched by common men only as a matter of privilege or of necessity; the fire produced by it is sacred, "comes from heaven," "is a gift of God," "is not common fire." We surely have here a religious survival in culture. Can we not be quite sure that the fire-drill was once used by every one among the Sacs and Foxes, when they wished to kindle fire? Easier and better means being found for gaining the spark, the older method fell out of use among the common folk but was retained by religious leaders in their ceremonials. We find among the Sacs and Foxes to-day three different methods of making fire. Common people, for all sorts of purposes, make fire with white men's matches; old men, conservative as old age ever is, light their pipes with flint and steel, which they carry about with them in their tobacco pouches; the priests, conservative of all conservatives, use the bow-drill. And so, as we go the world around, we find in many regions two or more methods of making fire. When one of these is friction with a drill we find it ever the sacred method. It is this reason that has led us to

believe that this quaint, difficult, patience and time-consuming method is the oldest that man used.

In Japan we may find almost every type of old fire-making still in use, the old methods being retained by religious conservatism. At Kitzuki we have the simplest of drills rolled between the hands; at Isé the bow-drill; almost anywhere the flint and steel. Lafcadio Hearn, in his "Glimpses of Unfamiliar Japan," says:

"The Guji removes the wrappings and I behold the most primitive form of fire-drill known to exist in the Orient. It is simply a very thick piece of solid white plank, about two and a half feet long, with a line of holes drilled along its upper edge so that the upper part of each hole breaks through the sides of the plank. The sticks which produce the fire, when fixed in the holes and rapidly rubbed between the palms of the hands, are made of a lighter kind of white wood; they are about two feet long, and as thick as a common lead pencil. . . . . Each year the temple receives a new fire-drill; but the fire-drill is never made in Kitzuki, but in Kumano, where the traditional regulations as to the manner of making it have been preserved from the time of the gods. For the first Kokuzo of Izumo, on becoming pontiff, received the fire-drill for the great temple from the hands of the deity, who was the younger brother of the sun goddess, and is now enshrined at Kumano."

Again, in speaking of the night lamps before the household shrines, he says:

"But by the strictly orthodox this is held to be very wrong, and even to light the lamps with a match is somewhat heretical. For it is not supposed that matches are always made with pure substances, and the lights of the Kami should be kindled only with purest fire—that holy, natural fire which lies hidden within all things. Therefore, in some little closet in the home of any

strictly orthodox Shinto family there is always a small box containing the ancient instruments used for the lighting of holy fire. These consist of the *hi-uchi-ishi*, or fire-strike-stone; the *hi-uchi-gane*, or steel; the *ho-kuchi*, or tinder made of dried moss; and the *tsu-kegi*, fine slivers of resinous pine. A little tinder is laid upon the flint and set smoldering with a few strokes of the steel, and blown upon until it flames. A slip of pine is then ignited at this flame and with it the lamps of the ancestors and the gods are lighted."

Friction-made fire in Europe.

In our tracing of the geography of fire made by friction of two pieces of wood, no mention was made of Europe. It would, however, be a great mistake to think that this practice has not prevailed in that continent as well as in those which we have mentioned. "Need fire," or "wild fire," was often made in Germany as late as the seventeenth century. "When a murrain has broken out among the great and small cattle and the herds have suffered much harm the farmers decide upon a need fire. On the day no fire is kindled in any house, but from each, brushwood, straw, and wood are brought. A stout oak post is driven into the ground and a hole bored through it; into this a windlass is stuck, well smeared with tar and cart pitch, and turned round so long that it gives forth fire. This is caught, increased with straw, heath, and brushwood until a full need fire; this is brought out lengthwise between the walls and fences and the cattle and horses hunted with sticks and whips two or three times through it." The need fire was kindled as late as 1826 near Perth in Scotland. A lady whose mother saw this fire kindled, and who had often heard of it, told me the story of it. It was kindled in the same way and for a similar purpose. It is said, and no doubt is true, that within the last two or three years, when the cholera has been raging throughout Russia, that the need fire was kindled in many Russian villages as a protection against, or as a means of getting rid of, the

"Need fire."

plague. How shall we explain the making of the need fire among civilized and Christian people at this late day?

A friend who was in Japan at the time of the dreadful earthquake, a few years since, tells us that just before the earthquake he had occasion to go out over the public highroad. He noticed all along the way the condition of neglect prevailing among the little shrines and idols by the roadside. A few days passed; the earthquake came; my friend again passed that way. But what a change! The shrines were neatly repaired; the idols set up and carefully repainted and freshly gilded. What does this mean? Why simply this, that, in these later days, the old religious views of the Japanese are gradually fading away. With the coming of western ideas, the native religions are neglected. But deep down in the Japanese heart there lurks a vague, uneasy feeling lest the neglected gods may rise in vengeance. The earthquake comes. Hastily the dues to the neglected gods are performed and danger is allayed.

Explanation of its occurrence.

It is probable that at one time in Europe fire was commonly made by means of friction of wood. When the practice fell out of every-day use it was preserved in religious ceremonies in a way similar to that which we have observed among the Sacs and Foxes. Gradually it came to be considered a thing pleasing to the gods in itself that fire should be made in this way. When the European pagans became Christians it was as natural for them in times of trouble to practice the old ceremonial in order to propitiate the old gods, in time of misfortune, as it was for the Japanese to paint up their shrines and gild their images after the earthquake. In time this, which at first was simply a performance intended to make peace with the neglected gods, came to be considered a charm against evil generally. And in this form it remains as the need fire in Europe at the present time.

The uses to which man puts fire after he has learned its use

and how to make it are varied. We have already incidentally referred to them. The fire supplies heat, cooks food, serves as a tool in hollowing out canoes and in felling trees, drives game, and scares away spirits. Lippert believes that the first value of fire was as a guard against animals and spirits. He quotes Judge Jury, speaking in regard to the Australians, as follows: "Against all bad spirits fire is an effective means of protection. There is no thought more fearful to the Australians than the gloomy hours of the night, during which evil spirits prowl about unless fire is present. So there burns through winter and summer, before every leaf shelter and every hut, the fire that is never allowed to go out, and a firebrand accompanies the Australian upon all his journeys." That this idea of Lippert may be carried much too far is shown by this quotation, taken from Tylor, referring to the natives of Fakaafo: "No fire is allowed to be kindled at night in the houses of the people all the year around. It is sacred to the god, and so after sundown they sit and chat in the dark. Two exceptions are found in the cook-house for the cooking of fish caught during the night, and in the house of confinement. Fire is not always considered valuable on account of its warmth. Simpson says of the Greenland Eskimo that "they never seem to think of fire as a means of imparting warmth. Their lamps are used for cooking, lighting, melting ice, and drying clothes."

Uses of fire.

The fire has made the home. We have heard much in these later days about woman's position. We are assured that she has not all her rights. Now, there can be little doubt that the primitive woman had all her rights. It is probable that she was as free as her husband to kill the wild beasts, catch the fish, fight her savage neighbors, eat the raw meat which she tore by main strength from the carcass of the lately slain beast. The beginning of woman's slavery was the discovery of the fire. The value of fire known and the need of feeding

Influence of fire.

it recognized, it became necessary that some one should stay by it to tend it. Notwithstanding the fact that woman had all her rights and was free to go and come as she would, it was still true that, on account of children and certain physical peculiarities, the woman was more naturally the one who would remain behind to care for the feeding of the flame. Before that, men and women wandered from place to place, thoughtless of the night. After that, a place was fixed to which the man returned after the day's hunt. It was the beginning of the home.

It is not strange that many sentimental and beautiful ideas have risen in connection with the fire on the hearth. Just as the fire in the individual home meant comfort and rest, relaxation and enjoyment, safety and security at night, the national fire, preserved in the temple of the tribe, came to have connected with it all sorts of fond and tender thoughts. The fire of the Greeks was carried by each colony from the old home and ever tended. In later times, at least, it was a bond of real connection between the mother-land and the new settlement.

CHAPTER III.

FOOD-GETTING.

The search for food.

ONE of the most remarkable things in the world is the never-ending quest for food. Mankind has ransacked the whole earth; he has searched the animal, the vegetable, and the mineral kingdoms; he has ascended to the very mountain tops, has gone down into the valleys, has dredged the ocean bottom, in his hunt for food. The quest began ages ago and it still continues with all the keenness and anxiety of the past. It is marvelous what curious things have been found to be palatable; how many sicknesses, how many poisonings, how many deaths, must have taken place before mankind fully learned what nature gave for such use!

Range of food materials.

As we look over the list of things eaten we are frequently horrified at the filthiness or disgusting character of some of them. Thus, the Australian eats marsupials, all kinds of birds, eels, fish, bats, frogs, lizards, snakes, and worms. The Bongo or Dor negro eats rats, snakes, carrion kites, bats, land scorpions, ants, and caterpillars. Schweinfurth tells some stomach-stirring tales about maggots. Tylor says: "The Andamanese live upon wild food, gather fruits and honey, hunt wild pigs in the jungles, and dig turtles and fish on the coast. The low Rocky Mountain tribes gather birds and snakes, and catch lizards from their holes with hooked sticks."

Savage improvidence.

Of course, food at first was eaten raw. That goes without the saying if man invented fire. Life was, with primitive man, as it is still with many savages, alternate feasting and famine.

When game has been killed, a whole group of individuals squat about it, tear the raw flesh from the carcass and eat it, gorging themselves like pigs. Then, half stupid, they lie until digestion has taken place. Later they resume the feast, and when the carcass is completely gone journey until fresh food is killed. It was a great step from this to storing food; to lay by what was not absolutely necessary to-day for future use in time of need or scarcity. It is a step which many people have taken, and among most barbarians and some savages we find definite storing away of food. Belcher says that the Eskimo lay by meat in store-rooms under their hut floors. The mass of raw bear, whale, walrus, seal, swan, duck, and elk are "frozen into a solid mass beneath, but loose from those on the surface, and seem to be incorporated into a gelatinous snow which they scraped up easily with the hand and ate with satisfaction. Fish oil predominated." All northern Indians in the United States lay by seeds of *zizania*, or water rice, and it must have been a common thing, at an early day, along the present location of the city of Chicago, to see the Indian women in their canoes bend down the stalks of water rice and beat the grains into the boat. The Indians of southern California and other western regions make neat granaries in which they store away acorns in quantity. Most tribes of eastern Indians raised corn and squashes; the corn, scraped from the cob, they dried for winter use, and the squashes were cut into long strips, which were frequently woven into mats and hung upon the walls of huts for drying.

Storing of food.

Tribes that cook food are better off than eaters of raw meat. They are more enterprising and energetic, as they have saved energy, first, by sparing labor to their digestive organs, and, secondly, by saving labor to those organs which would be concerned in preparing the necessarily greater mass of food which was consumed when eaten raw. Primitive cookery is an interesting study. Perhaps the first was roasting or parching;

Cooked *versus* raw food.

Primitive cookery.

Roasting and parching.

then came baking; then boiling. Roasting of meat by exposure to the open flame and parching of grains or seeds are common among all peoples. Lippert suggests that the latter may have been suggested by burning grains out of their husks, instead of laboriously beating them out. Every one knows how readily steaks may be cooked by spitting them on sticks stuck slantwise in the ground over fires, and how potatoes may be baked in the hot coals or ashes.

The boy is a savage.

He who does not remember how delightfully such things tasted in his boyhood, and who cannot look back upon some picnic party where he indulged in savage cookery, has lost a real chapter from his life. It is curious, but true, that the real boy enjoys such viands more than the choicest which the house affords. Children everywhere delight in all sorts of raw and indigestible foods; artichokes, chestnuts, sweet canes—these are some of the many delicacies that delight the youthful palate. The whole subject is more interesting and more important than at first appears. It is a fundamental law in evolution that the individual in its development reproduces the life history of the race. Why does the tadpole breathe by means of gills, swim by a broad tail, and show no signs of legs at first? Why does it then gradually lose its gills, drop off its tail, produce first one pair of legs and then the other pair? It is because the ancestor of the frog was no frog, but was a fish-like creature, breathing by means of gills and swimming by means of its propulsive tail. Later ancestors of the frog had smaller gills, a lessening tail and legs. Every frog of normal kind in its development tells over the marvelous story of the evolution of its kind. What is true in the world of animals and physical structures is just as true in mental and culture history development. Every person who passes through a normal development represents the culture stages of man; the child at first is a savage, later he becomes a barbarian, still later it is possible

The law of recapitulation applies here.

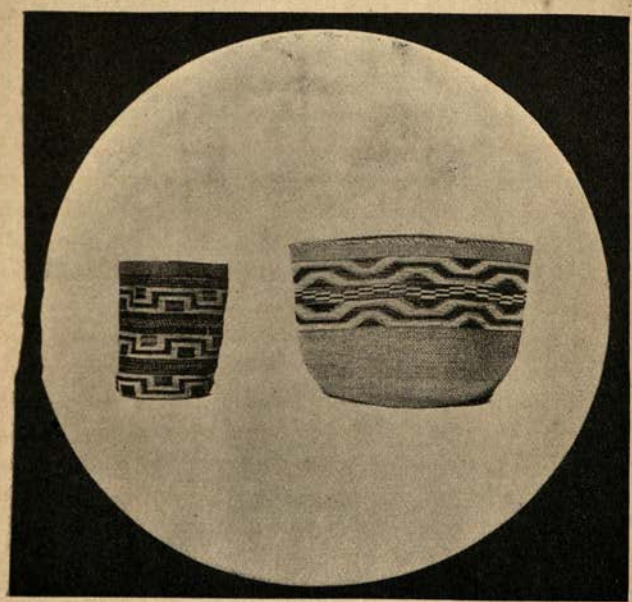

FIG. 2.—ALASKAN INDIAN BASKETRY.

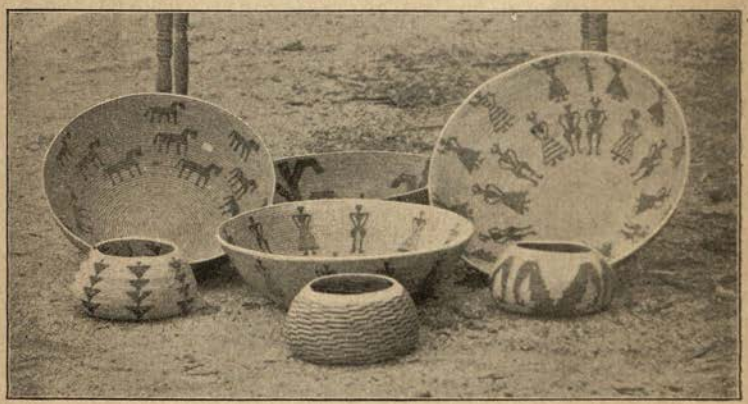

FIG. 3.—COAHUILLA (California) BASKETS.

that he may become a civilized being. The boy in the woods building his fire, baking potatoes in the ashes, roasting steak over the coals, is living over again the wild outdoor savage life of his ancestors. The same thought might be illustrated by a thousand other points in child life. It is fortunate that the more advanced teachers of children and the most progressive kindergartners are beginning to realize this fact, and in the training of children deal with them at first as savages, gradually developing them through barbarism into healthy, wholesome civilization. There are, however, plenty of parents who, still ignorant of this fundamental idea, demand from children in the state of savagery all the graces and fruits of advanced civilization. The result is easily imagined.

Next to roasting and parching comes baking. There are some very primitive methods. Tylor states that the Andamanese keep fires smoldering in hollow trees, so that they have only to clear away the ashes in order at any time to cook their little pigs and fish; in Africa a great ants' nest cleaned out makes an oven wherein even such great joints as those of the rhinoceros are cooked. Lubbock quotes the way in which Tahitians baked the hog. "They made a small pit in the ground, which they paved with large stones, over which they then lighted fires. When the stones were hot enough they took out the embers, raked away the ashes, and covered the stones with green cocoanut leaves. The animal having been cleaned and prepared was wrapped in plantain leaves and covered with hot embers, on which again they placed bread-fruit and yams, also wrapped in plantain leaves. Over this they spread the rest of the embers and more hot stones, finally covered with earth. The meat thus cooked is very tender and full of gravy."

Baking.

It is a common thing among various peoples to dry meat in the open air. The jerked beef of the North American Indian

Dried and smoked meat.

was simply buffalo meat that had been prepared in this way. The buffalo is now a thing of the past for the Indian, but he still takes meat and cuts it into thin sheets, strips, or slices, which he dries in the old way. One may see such meat, hanging in the sun in the clear air of New Mexico or southern California, even at the present time. In such cases the meat does not decay, but in that fresh, dry atmosphere simply dries. A variation of this means of preserving flesh is, of course, the drying of it on supports over smoking fires. Tylor says that the *boucan* of the Caribs was a device for such preservation. It consisted of four upright sticks with a grating of sticks over fire. The meat was laid upon these. A similar device is said to be found in Africa, Kamtschatka, the East Indies, and the Pelew Islands.

Boiling.

Boiling food was relatively a late invention. It is said to be unknown to the Fuegians and Bushmen. It was devised in many cases long before pottery was invented or the use of kettles and pots of metal. In fact, the oldest boiling pots seem to have been made of skin or bark or wood, or other such substances. There is a tribe of North American Indians named Assinaboins; the word means "stone boilers," and they were named from the way in which they boiled meat. Having killed a buffalo, they scooped out a round hole in the ground and lined it with the skin of the beast himself. They then poured into it water, placed the pieces of meat therein, and then, in a neighboring fire, heated stones very hot; these were dropped into the water and the meat boiled in this way. The same method of stone-boiling was, of course, applicable to vessels made of basket-work or wood. Some of the tribes of our Northwest coast try out oil by this means. A canoe is filled with water, the oolachan fish, which consists almost entirely of oil, are thrown into it until the canoe is full or nearly so, and then hot stones are dropped in; the water becomes so greatly heated

Stone-boiling.

that the oil is driven out, floats on the surface, and is scooped up with skimmers. The wild Irish as recently as 1600 were stone boilers, and the inhabitants of the Hebrides and Shetland Islands still heat milk by this means. Other materials besides bark and wood may be used for vessels for stone-boiling; in South America the spathes (great leaves which encircle and enclose the flower cluster) of the palm are used; split bamboos are used by Dyaks, Sumatrans, and Cambodians as vessels for boiling rice, while the Radac Islanders use cocoanut shells. Of course, when pottery was once invented it rapidly drove out the clumsy device of stone-boiling. America may be quite easily divided by a line running from northeast to southwest into two great areas, in one of which stone-boiling is still used or has been recently employed, while in the other pottery has been abundantly developed.

Bills of fare of lower tribes:

It would be a great mistake to think that savage and barbarous tribes do not appreciate good food. They have devised many curious ways of preparing and cooking edibles and many of their dishes are not to be sneered at, even by civilized people. Tahitians are said to have had a definite list of some forty or more prepared dishes. Of a Tahitian pudding which was made as follows it is said that "few puddings in England equal it."

Tahitians.

"Bread-fruit, ripe plantains, taro, pandanus nuts were rasped, scraped, or pounded up fine and baked separately; a quantity of juice from cocoanut kernels was put into the large tray or wooden vessel, the other articles hot from the oven were put in also, and a hot stone added."

Food depends on surroundings and influences life.

The food supply varies, of course, with the locality. What a man eats depends very largely on where he lives; what he eats determines very largely his character; and the devices which are necessary to secure his food dictate and influence his arts and industries. It is worth while to look for a moment at the detailed bill of fare of two or three peoples who occupy mark-

Tribes of the Northwest coast.

edly different districts. To the west of our great mountain range, along the Pacific coast from Vancouver Island northward, dwell particularly interesting tribes of Indians. Behind them are the mountains, and in the forests are flesh and fowl to be had for the hunting; but the sea before them is their main larder. They live chiefly upon fish or water animals, and birds. The waters swarm with halibut, salmon, cod, herring, oolachan. They eat seals and porpoises, and delight in blubber. The eggs or roe of fish are a delicacy; shell fish, sea urchins, and snails are welcome. Oil seems to be a necessity. It is certainly a delicacy and valued food. Berries are gathered from the land, and roots and barks of various kinds are used for food. But even in the way of plants the sea yields a supply of seaweed.

Niblack and Emmons give further details in regard to food and preparation. Fish are eaten fresh and vast quantities of salmon, halibut, and herring are dried for future use. The oil which we have referred to is obtained from seals, porpoises, herrings, salmon, oolachan, goats, deer, bear, dogfish, etc. The favorite kind is from the oolachan, a little fish so fat and oily that when thrown into the boiling pan it almost disappears, leaving little but a few bones behind. The oil which it yields is semi-solid when cold and has a fetid and rancid smell and taste. The fish are first allowed to partly putrefy, and then are boiled by means of stones, as we have already described. A box of oil weighing some one hundred pounds is worth from six to twelve blankets, or twelve to twenty dollars. The oil is usually used in connection with other food. Almost all solid food, such as dried fish, is broken into bits and dipped in the oil and whirled around until it gains a fair load of the grease, when it is deftly carried to the open mouth. A great delicacy among the Haidas and Tsimshians is salmon roe, which is gathered, put in boxes, and buried just below high-water mark on the beach. When the mass is somewhat decomposed and smells

vilely it is ready for use. Dried roe is also much used, and is prepared for eating in two or three ways; sometimes it is pounded between stones, diluted with water, and beaten with wooden spoons to a creamy consistency; at other times it is boiled with sorrel and different dried berries and molded in wooden frames into cakes, twelve inches square and one inch thick. This practice of pressing food substances into great cakes for storing away is quite in vogue throughout this district, and besides fish roe, seaweed, and spruce, hemlock and pine bark are so prepared. One species of seaweed which is quite black when dried is used for making sopallally, of which the Indians are immoderately fond. It is made by breaking up a very small piece of the pressed seaweed in a bowl or dish and adding warm water; it is then beaten with a wooden spoon and sugar is added; it froths and foams, like the white of an egg, and gradually turns from a terra-cotta color to white; berries are sometimes added. From a piece two inches square a two-gallon measure could be easily made. The flavor is agreeable but it leaves a bitter taste in the mouth. It is usually eaten at the close of a meal as a dessert.

Food stock of the Blackfeet.

In quite a different way do we find the Plains Indians, far away from the sea and mountains, within reach of great herds of buffalo, living and feeding. George Bird Grinnell describes very fully this type. We quote from him:

"The diet of the Blackfeet was more varied than one would think. Large quantities of sarvis berries (*Amelanchier alnifolia*) were gathered whenever there was a crop (which occurs every other year), dried, and stored for future use. These were gathered by women, who collected the branches laden with ripe fruit and beat them over rugs spread upon the ground. Choke cherries were also gathered when ripe, and pounded up, stones and all. A bushel of fruit, after being pounded and dried, was reduced to a very small quantity. This food was

sometimes eaten by itself, but more often was used to flavor soups and to mix with pemmican. Bull berries (*Shepherdia argentea*) were a favorite fruit, and were gathered in large quantities, as was also the white berry of the red willow. This last is an exceedingly bitter, acrid fruit, and to the taste of most white men wholly unpleasant and repugnant. The Blackfeet, however, are very fond of it; perhaps because it contains some property necessary to the nourishment of the body, which is lacking in their every-day food.

"The camas root, which grows abundantly in certain localities on the east slope of the Rockies, was also dug, cooked, and dried. The bulbs were roasted in pits, as by some Indians on the west side of the Rocky Mountains. It is gathered while in the bloom—June 15 to July 15. A large pit is dug, in which a hot fire is built, the bottom being first lined with flat stones. After keeping up this fire for several hours, until the stones and earth are thoroughly heated, the coals and ashes are removed. The pit is then lined with grass and is filled almost to the top with camas bulbs. Over these grass is laid, then twigs, and then earth to a depth of four inches. On this a fire is built, which is kept up for from one to three days, according to the quantity of the bulbs in the pit.

"When the pit is opened, the small children gather about it to suck the syrup, which has collected on the twigs and grass, and which is very sweet. The fresh roasted camas tastes something like a roasted chestnut, with a little of the flavor of the sweet potato. After being cooked, the roots are spread out in the sun to dry, and are then put in sacks to be stored away. Sometimes a few are pounded up with sarvis berries, and dried.

"Bitter-root is gathered, dried, and boiled with a little sugar. It is a slender root, an inch or two long and as thick as a goose quill, white in color and looking like the short lengths of spaghetti. It is very starchy.

"In the spring, a certain root called *mats* was eaten in great quantities. This plant was known to the early French employees of the Hudson Bay and American fur companies as *pomme blanche* (*Psoralea esculenta*).

"All parts of such animals as the buffalo, elk, deer, etc., were eaten, save only the lungs, gall, and one or two other organs. A favorite way for eating the paunch, or stomach, was the raw state. Liver, too, was sometimes eaten raw. The unborn calf of a fresh killed animal, especially buffalo, was considered a great delicacy. The meat of this, when boiled, is white, tasteless, and insipid. The small intestines of the buffalo were sometimes dried, but more often were stuffed with long, thin strips of meat. During the stuffing process the entrail was turned inside out, thus confining with the meats the sweet white fat that covers the intestines. The next step was to roast it a little, after which the ends were tied to prevent the escape of the juices, and it was thoroughly boiled in water. This is a very great delicacy, and when properly prepared is equally appreciated by whites and Indians.

"As a rule, there were but two ways of cooking meat—boiling and roasting. If roasted, it was thoroughly cooked; but if boiled, it was only left in water long enough to lose the red color, say five or ten minutes. Before they got kettles from the whites, the Blackfeet often boiled meat in a green hide.

"In time of plenty, great quantities of dried meat were prepared for use when fresh meat could not be obtained. In making dried meat, the thicker parts of an animal were cut in large, thin sheets and hung in the sun to dry. If the weather was not fine, the meat was often hung up on lines or scaffolds in the upper parts of the lodge. When properly cured and if of good quality, the sheets were about one fourth of an inch thick and very brittle. The back fat of the buffalo was also dried, and eaten with the meat as we eat butter with bread. Pemmican

was made of the flesh of the buffalo. The meat was dried in the usual way; and, for this use, only lean meat, such as the hams, loins, and shoulders, was chosen. When the time came for making the pemmican, two large fires were built of dry quaking-aspen wood, and these were allowed to burn down to red coals. The old women brought the dried meat to these fires, and the sheets of meat were thrown on the coals of one of them, allowed to heat through, turned to keep them from burning, and then thrown on the flesh side of the dried hide, that lay on the ground near by. After a time, the roasting of this dried meat caused the smoke to rise from the fire in use, which gave the meat a bitter taste, if cooked in it. They then turned to the other fire and used that until the first one had burned clear down. After enough of this roasted meat had been thrown on the hide, it was flailed out with sticks, and being very brittle was easily broken up and made small. It was constantly stirred and pounded until it was all fine. Meantime, the tallow of the buffalo had been melted in a large kettle, and the pemmican bags prepared. These were made of bull's hide, and were in two pieces, cut oblong and with the corners rounded off. Two such pieces sewed together made a bag which would hold one hundred pounds. The pounded meat and tallow—the latter just beginning to cool—were put in a trough made of bull's hide, a wooden spade being used to stir the mixture. After it was thoroughly mixed it was shoveled into one of the sacks held open, and rammed down and packed tight with a big stick, every effort being made to expel all the air. When the bag was full and packed as tight as possible it was sewn up. It was then put on the ground and the women jumped on it to make it still more tight and solid. It was then laid away in the sun to cool and dry. It usually took the meat of two cows to make a bag of one hundred pounds; a very large bull might make a sack of eighty to one hundred pounds.

"A much finer grade of pemmican was made from the choicest part of the buffalo with marrow fat. To this dried berries and pounded choke cherries were added, making a delicious food, which was extremely nutritious. Pemmican was eaten either dry as it came from the sack, or stewed with water.

"In the spring, the people had great feasts of the eggs of ducks and other waterfowl. A large quantity having been gathered, a hole was dug in the ground and a little water put in it. At short intervals above the water, platforms of sticks were built, on which eggs were laid. A smaller hole was dug at one side of the large hole, slanting into the bottom of it. When all was ready, the top of the larger hole was covered with mud, laid upon crossed sticks, and red-hot stones were dropped into the slant, when they rolled down into the water, heating it, and so cooking the eggs by steam.

"Fish were seldom eaten by these people in the early days, but now they seem very fond of them. Turtles, frogs, and lizards are considered creatures of evil, and are never eaten. Dogs, considered a great delicacy by the Crees, Gros Ventres, Sioux, Assinaboins, and other surrounding tribes, were never eaten by the Blackfeet. No religious motive is assigned for this abstinence. I once heard a Piegan say that it was wrong to eat dogs. 'They are our true friends,' he said. 'Men say they are our friends and then turn against us, but our dogs are always true. They mourn when we are absent, and are always glad when we return. They keep watch for us in the night when we sleep. So pity the poor dogs.' Snakes, grasshoppers, worms, and other insects were never eaten. Salt was an unknown condiment. Many are now very fond of it, but I know a number, especially old people, who never eat it."

CHAPTER IV.

FOOD-GETTING (*Continued*).

Cannibalism:

MAN has ransacked the earth for food; he has tested mineral products, plants, and animals; his experiments have not been confined, but are almost completely inclusive. There has been no animal too small or filthy for him to use. It is not strange that in an experimentation so wide and comprehensive, his fellow-man should also have been a victim. As a matter of fact, cannibalism exists to-day in portions of the world, and, in the past, it has prevailed over very many regions where it is now absent. This matter of cannibalism, while it is a dreadful one, is curious and interesting. That man should eat his kind in time of dire need — in famine — is not strange. Even the most civilized peoples have done so. The Wends, according to Tylor, put their aged people to death, cooked, and ate them. Schiller states that the Saxons at the end of the Thirty Years' War had become cannibals. Peschel narrates that, at the siege of Messina, flesh of captured soldiers was eaten, selling at varying price for varying race. Frenchmen have been known to exhume the body of a detested officer and to eat the flesh. Letourneau says that St. Jerome, in one of his letters, describes Scotch cannibals, who were extremely fond of steaks taken from young girls and boys. In Melanesia—particularly in Fiji and New Caledonia—in Africa among the Kaffirs, in New Zealand, Australia, and Tierra del Fuego we find the practice of cannibalism in time of need.

From necessity;

To eat human flesh in time of need is an unfortunate thing,

but there are peoples, among whom cannibalism is found, who cannot urge as excuse crying need. It is very curious to notice the different ways in which cannibalism is indulged among the various populations of the world. Thus there are some cannibals who are veritable gourmands in the matter of human flesh. The Fuegians, the New Caledonians, are such; the Fans, Niam-niams, and Monbuttus are such; Schweinfurth mentions evidence of cannibalism among the latter. He says, between two cabins whose doors opened opposite each other, a child, new-born and dying, was laid upon a mat. At the door of one of the cabins a man tranquilly played upon a mandolin. At the other door an aged woman, in the midst of a group of boys and girls, was preparing gourds for supper. The kettle full of boiling water stood ready and all were only waiting for the death of the child, whose body was to supply the principal dish for the meal. About the year 1200 A. D. a famine desolated the land of Egypt. In all the cities—Alexandria, Syene, Damietta—cannibalism took place upon a great scale. People gave themselves up to man-hunting, and above all to child-hunting—for roasted child was considered an excellent meat. The thing went on to such an extent that every effort was made to suppress it by law. The punishment, by burning at the stake, so little deterred the cannibals that the criminals, who had been thus punished, were sometimes eaten by others as soon as they were cooked. This gormandizing in human flesh lately prevailed throughout Polynesia, occurred in South America, and along the northwest coast of North America.

From desire;

A different motive is found in vengeance. The case which we have quoted from France really falls under this head. It is not at all uncommon among savage and barbarous people for a dead enemy to be devoured, and in this eating there are two ideas usually to be recognized—the first is that of simple vengeance, the second is the desire to gain the qualities of the

From motives of vengeance;

enemy by the eating. This last idea we find almost everywhere. Thus the Senecas during the Revolutionary War ate two white Americans in order to gain bravery in warfare. In China, during the war with England, a merchant of Shanghai met his servant who was carrying to the house the heart of a rebel that he might eat it; not because he liked the flesh, or from hunger, but that he might gain courage by the act. Many African tribes and some South Sea Islanders are among those who indulge in cannibalism from such motives.

From religious motives;

Even more commonly the eating of human flesh is done as a religious act. The Maoris in New Zealand divided the slain with the gods, cooking, eating, and offering parts to them. So among the Marquesans the victim was strangled to prevent loss of blood. The eyes were prized and given to warriors; the heart was eaten raw; the rest of the body, wrapped in leaves, was cooked in the Polynesian oven. The feet, hands, and ribs were given to the chief; the rump and choice morsels were reserved for the high priest. Formerly, in Tahiti, the priest offered the eyes of a sacrifice first to the chief and then, at his refusal, to the gods, whom they believed were very fond of human flesh. Inasmuch as people generally make up gods on their own pattern, we may be quite sure that the fondness for human flesh must once have prevailed among the Tahitians. Aztecs of Mexico "fattened and ate prisoners in great numbers and went to war for the sole purpose of capturing this kind of game." And their cannibalism was usually connected with great religious ceremonies.

From filial piety;

Among the Battas of Sumatra, who, by the way, are a fairly advanced and extremely interesting people, with a knowledge of writing and with books, we find two of the most curious forms of cannibalism. One of these we may call cannibalism through filial piety. They eat, ceremonially, and with great filial affection, their old parents; they select for a feast a time

when the citrons are abundant and salt is cheap. On the appointed day the old man who is destined for eating climbs up a tree at the foot of which his relatives and friends gather. These strike the trunk of the tree, beating time and singing a funeral hymn, the general meaning of which is, "Behold the time has come, the fruit is ripe, let it fall from the tree." The old man then comes down out of the tree; his nearest relatives kill him and afterward he is eaten.

The other motive to cannibalism among the Battas is judicial in its character. There are certain criminals, such as the adulterer, the robber, and the traitor, who are eaten by the people. The victims are bound to posts with their legs and arms spread in the form of a St. Andrew's cross. At a given signal all the spectators rush out, dispatch him with their weapons, and tear him to pieces, which are eaten raw and bloody after being dipped into a mixture of cocoanut, citron juice, and salt.

For legal punishment.

Such, then, are the astonishing forms of cannibalism found among the different peoples of mankind and some of the motives which are assigned for it, or which may be urged in its defense; necessity, gormandizing, vengeance, or the desire to secure some attribute, religion, filial piety, judicial execution. Before leaving this rather ghastly subject, two very curious things should be mentioned. The first is this: Cannibals frequently, or even generally, surpass their neighbors in civilization; and, secondly, they eat dogs as well as human beings. The first of these statements may be astonishing. In Africa there are to-day no people who surpass in culture the Monbuttus, Fans, and Niam-niams; it is precisely among these tribes that cannibalism in its most outrageous form is said to flourish. In Sumatra it is not the lowest people who eat human flesh, but the Battas, who, as we have said, possess a written character, books, and many other features of a fairly

Two curious facts.

(*a*) Cannibals often surpass their neighbors in culture.

advanced civilization. In America it is the Aztecs and other foremost tribes of Mexico and Central America who are most frequently charged with this dreadful practice. The New Zealanders are among the best of Polynesians in their culture, while the Fijians stand markedly above their fellow Melanesians. Writers have more than once attempted to explain this curious fact; it can hardly be said, in an entirely satisfactory way. One of the more commonly urged explanations is, that in all these cases peoples have passed directly from savagery—with its hunting life and dependence upon animal food—into settled agricultural conditions without having passed through the stage when flocks and herds were cared for. The second point, namely, that cannibals are dog-eaters as well as man-eaters, needs no particular attention. Most tribes who depend to any great extent upon the dog for help in hunting, or who have made of it a companion, would naturally hesitate about killing and eating a favorite beast. Without asserting it too strongly, it might be said that where the eating of dogs is found to be a marked feature in life and cannibalism is absent, it is probable that close investigation will show the people to have been lately cannibals.

(*b*) Cannibals usually are dog-eaters.

Cannibalism once indulged is not easily outgrown. The craving reasserts itself at times with terrible force. Not many years ago a party of Fijians, apparently driven by an irresistible desire, or perhaps by a complex of motives, fled to a cavern where a cannibal feast took place. A pursuit party, arriving at the cave, found signs of the banquet, although the feasters were gone. Bloody bones and curious, hastily made wooden forks told the story. These forks of wood were necessary, for the Fijian may not handle human meat with his fingers.

Force of the desire for human flesh.

Several readily accessible books treat more fully of this subject. Letourneau and Andree, in particular, may be mentioned

for reference. The accompanying table may be of use in suggesting recent distribution of the practice in its various forms. It is based largely upon Letourneau's facts.

Cannibalism.

Table of cannibalism.

Necessity.	*Gormandizing.*	*Vengeance, etc.*
Melanesia entire, especially Fiji and New Caledonia.	Fiji, New Caledonia.	Ashanti, Bantu, Mtamba.
New Guinea.	Zulu, Basuto, Fans, Niamniam, Monbutto.	Marquesas, Tahiti, Raratonga.
New Zealand.	Egypt, Algeria.	Senecas.
Kaffirs.	New Zealand, Marquesas, Friendly Islands, Hawaii, Bow Islands.	China, Bhutan, Koukis.
Australia.	(Moxos) Guarani, Caribs.	France.
Tierra del Fuego.	Nutka-Columbians.	
Hurons, Iroquois, Eskimo.	Saxons, Scotch.	
Messina (Siege of).		

Religion.	*Filial Piety.*	*Judicial.*
Fiji, Tanna.	Battas of Sumatra.	Battas of Sumatra.
Grand Bassam, Biheños, Dahomey.	Massagetae and Issedones.	Kissama eat criminals condemned to death.
New Zealand, Marquesas, Tahiti.	Tibet 13°.	Bow Islands.
Mexico.		

CHAPTER V.

Basketry and Pottery.

Art of basketry.

One of the commonest of arts among the lower races is basketry. It is certainly very old, and has frequently been fully developed in the Stone Age. In its simplest form it consists simply in the platting of splints. The materials for it are to be found almost everywhere, and are generally narrow, flat shreds of wood, strips of bark, or cords of some kind. The

Among Sacs and Foxes;

women among the Sacs and Foxes make all kinds of pouches or bags, for carrying articles, in basket-work. One of the simplest forms is made of strips of slippery elm half an inch broad, very thin, and of considerable length; these are simply platted, one strip being passed under, and then over, and then under, strips running in the contrary direction. More elaborate basket sacks in which geometrical designs of different colors are wrought are made from strands of white-ash bark. The manner of handling and managing these strips in this case differs greatly from the preceding. A series of strips are laid side by side. They are then crossed at intervals by cords

Shoshones;

which are wrapped around each one of them and then securely tied. The Shoshones make basket pots of tough roots wound in plies around the center, forming a vessel shaped like an inverted beehive; these plies are held together by a small tough root passing under and over them alternately. The vessels

Mokis, etc.

produced are water tight. Many of our southwestern tribes make most beautiful baskets. The Mokis make water jars and all sorts of vessels, graceful in form and finely woven; fre-

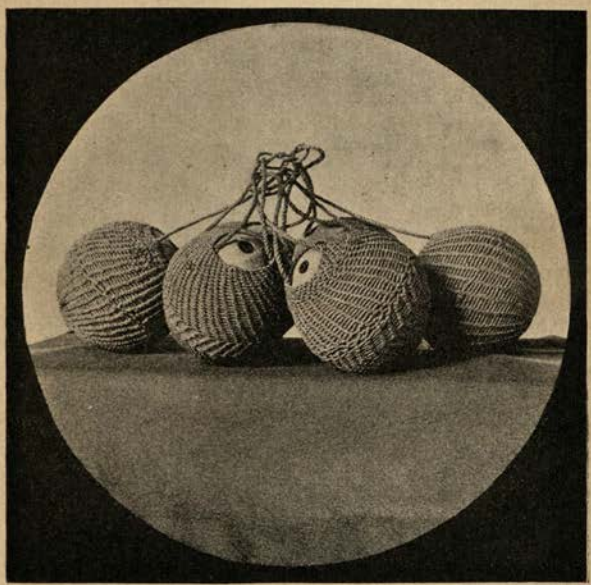

FIG. 4.—COCOANUT VESSELS IN CORD CARRIERS. South Sea Islands.

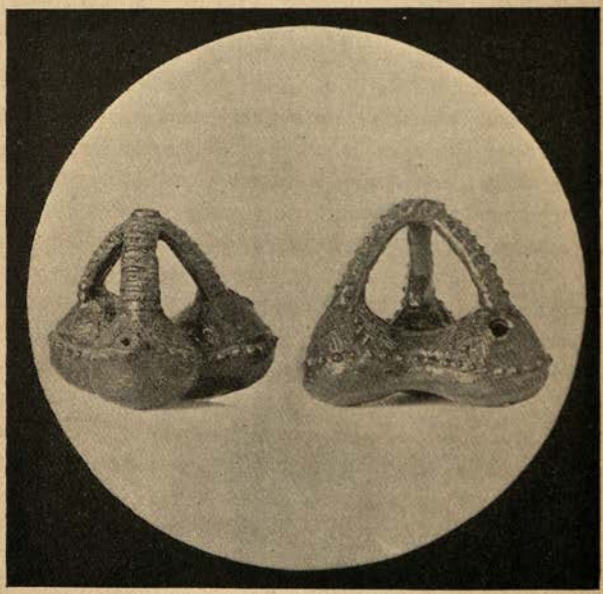

FIG. 5.—POTTERY. Fiji.

quently the splints or materials used will be of divers colors and arranged in patterns and tasteful designs. Their basketry is what is usually known as "coiled ware," as distinguished from platted ware or splint work. A bunch of soft grass stems, pliant and flexible, is taken ; it is coiled around itself, as a rope might be, and a long, slender, tough thread or strip of some vegetable matter is then taken, and is used like string, passing over and over the coil, sewing its folds firmly to each other. Such baskets when finished do not show the inner core or grass which really makes the coil, but only the outer wrapped and fastening strip. Every one knows the lovely baskets made in this way, which come from southern California. In the Vancouver Island district and further north beautiful basket-work is made from grasses, which being frequently dyed in rich colors yield artistic and striking effects. Some Vancouver Indians will take any object the traveler gives them, such, for instance, as a bottle, of any size or shape, and will cover it with the neatest of close-fitting basket casings, ornamented with geometric or other patterns in various tints.

The Northwest coast tribes.

Among certain African tribes we find a similar perfection in the art of basketry. Excellent shields, often well ornamented with colored patterns, occur there. Among the Nyassa, Livingstone saw beer in baskets, and such vessels are used for milk in Kaffirland.

Basketry in Africa.

A moment's consideration will show that any ornamentation in color in basket-work of any type must necessarily assume more or less of rigid and geometric forms ; this is inherent in the material and the method of using it.

Ornamentation in basket-work.

Of course, vessels are at all times a necessity. The first is the human hand, with which water is scooped up. There are plenty of peoples who have not yet devised the use of clay vessels or pottery. The Andamanese, some Australians, the Maoris, Fuegians, Patagonians, and Polynesians have no pottery.

Primitive vessels.

Nature supplies vessels and these have been used everywhere before true pottery was invented. So the Andamanese use shells or pieces of bamboo for water vessels; the Australian has skins and vessels of bark; the Maoris used gourds. The Tahitians had large dishes of polished wood; shells of cocoanut scraped thin and polished and carved were used for cups. The Polynesians used bladders for water vessels; the Fuegians made theirs of beech-bark. Even such unlikely things as egg-shells or stomachs have been used as bottles or water jars. Bushmen women commonly carry nets filled with ostrich egg-shells as water carriers. The same tribe uses all sorts of skins for vessels; from lizard skins they make dainty pouches, from antelope skins traveling sacks.

The law of copy.

A law of very wide application and which must always be remembered may be called "the law of copy." It is this: When a new art is introduced, or when a new material is supplied to an art, the form previously in use is copied. Hence, when pottery comes in, it imitates the shapes of vessels already in use. We have seen that the list of pre-pottery vessels is a long one and that it contains both natural and artificial forms and objects. Thus, of natural objects used for vessels we have bamboo stalks, ostrich eggs, sea-shells, hollow horns, skulls of man or beast, gourds, cocoanut shells, skins, bladders, stomachs; of artificial vessels we have those of stone, wood, horn, bark, basketry. All of these may be copied, and in fact are copied, in clay when pottery is invented.

Steps toward pottery.

The way in which pottery arose seems to be somewhat as follows: In South America natives were seen to plaster over boiling pots with a kind of clay, a finger thick, in order to prevent the fire from burning them. Gourds may be made to withstand heat by clay coating. When Cushing first visited the Havasupai of Arizona he found them boiling food in wicker jars by means of hot stones, and parching seeds, crickets, etc.,

in a shallow clay-lined tray of basket-work. After much use it is plain that the clay-lining of such a tray, put in, of course, to protect the basket itself from burning, would become hardened by the heat to which it was subjected; if now the basket should separate from the clay-lining, we should have left a clay dish. Tylor mentions that the Eskimo sometimes widen the rims of their stone vessels by means of clay. In all these different ways we have hints of the art of pottery; hints which are fruitful of results. There is the best reason to believe that the first baking of clay was developed in such ways. Squier and Davis mention old kilns still containing pottery partly burned and retaining the rims of gourds upon which they had been molded and which had not been entirely destroyed. Many old, large clay vessels show plainly that they were made within baskets which were simply burned off; others are made in nets, and in Peru crucibles are made of cloth coated over with clay.

Origin of pottery forms.

The whole matter of the origin of pottery forms and decorations has been carefully gone into by Mr. Holmes, who shows by many examples that pottery was certainly developed in the way we have suggested, and that it has certainly in many cases copied the forms of older vessels. From mounds in Arkansas and Missouri one digs great cups made of sea-shells from the Gulf of Mexico; from the same mounds are also taken clay vessels of precisely the same shape, and which show in their ornamentation the attempt to reproduce the natural features of the shell. In Nicaragua quantities of great clay jars are shaped precisely like the vessels, made of stomachs, which the people used before. All through our Southern States the long-necked gourd is used for dippers and water flasks; in the same district, vessels of pottery imitate the old form. In the Southwest, we have noticed that baskets were frequently used for water jars and bottles; the old pottery from the same district not only reproduces the shapes that are so commonly made in the older

art of basketry, but also reproduce the decorations suited to that kind of work.

Origin of pottery decorations.

The natural vessels to which we have referred, such as cocoa-nut shells and gourds and ostrich shells, in order to be carried needed to be fastened or held by cords. When the old vessel was replaced by pottery, the cords which before had served a useful purpose as carriers were likely to be copied in color or otherwise upon the clay dish as ornament. In the Pitt-Rivers Museum at Oxford, there is a case of pots and jars decorated with painted lines, which are of such character and so related to each other as to make it quite certain that they were suggested by such old cord carriers.

Cushing on Zuñi pottery.

Mr. Cushing has written an interesting article upon the development or evolution of Pueblo pottery. He traces the history first by means of language and second by technique. He believes that by a study of the words used by the Zuñians he can make out the following points: At first, canes or wooden tubes were used. Such vessels are called *sho-tom-me;* the word for canes being *sho-e*, and the word for wooden tubes *tom-me*. Next gourds were used. Gourd vessels were called *shop-tom-me;* from *sho-e-cane* and *tom-me*—wooden tubes, and *po-pon-nae-e*, meaning bladder-shaped; that is, gourd vessels, by etymology, would be bladder-shaped canes or wooden tubes. Then, baskets were used and basket vessels were called *tom-ma*. This word is plainly analogous to the one that means wooden tube. While basket vessels replaced the use of gourds in daily life, the latter were long retained and even now, perhaps, are used in religious ceremonies. Finally, pottery was devised and the word for pots is *wo-li-a-kca-ni-pu-li-a-tom-me;* the literal meaning is, coiled cooking basket; in other words, the pot at first was only the reproduction of the real basket which had been used for boiling food.

Here archæology also helps us out. The second line of

argument is drawn from technique. The oldest pottery of this whole district is what is known as coiled ware. It will be remembered that the Indian women of southern California make their basket-work out of a coiled rope composed of grass; it was impossible for the pot-maker to break away all at once from basketry and its methods; hence the coil of grass was replaced by a coil of clay. Bowls were made on the outside of baskets by winding a coil of clay around and around. Gradually more freedom arose and the building of ollas within a base of basket-work was developed. When burnt and allowed to shrink and dry the jar is easily removed. The ornamentation on Pueblo pottery has passed through a series of changes, angular designs predominating and the ornamental effect depending as much on the open and undecorated spaces as on the designs. This is more and more true as we go backwards and particularly characterizes the more ancient decorated wares. This is as we might expect, for it will be remembered that the natural decoration of basketry is geometrical; as pottery, in that district, in forms and technique is developed out of basketry, the ornamentations first in vogue would, of course, be such as are found in the samples of that art. The evolution of ornament in this southwestern pottery appears to have passed through some four stages; it was at first incised or indented; then it became relief ornament; then came black patterns on light ground; and lastly colored patterns on white or colored surfaces.

CHAPTER VI.

HUNTING.

Man and other animals.

A LARGE part of primitive food of mankind certainly came from the animal kingdom. Man is not by nature so well-endowed for capturing and killing other animals as many of the lower members of the animal kingdom. He can be outrun, outscratched, outhugged by many another creature. Neither fleet, nor large, nor strong, he very early was obliged to contend against and conquer animals much his superiors. He did not realize as we now do how vastly he outranked them in some ways; on the contrary, the other animals filled him with feelings of fear, awe, dread, respect. He considered them more cunning than himself—he knew them more powerful; but pitted against them he, little by little, gained advantage of them. Even the little pygmies of Africa assail the elephant, with their tiny poisoned arrows; Eskimo attack fearlessly the giant walrus or the polar bear.

Hunting among savage men.

Of course, at first man must either attack the brutes with his naked hands, his claws, his feet, his teeth, or help himself with stick or stone seized at the moment of combat. Later he came to devise and improve weapons, until at last we find even some savage tribes fairly equipped for conducting warfare against both savage man and wild beast. We shall not in this chapter refer to the development of weapons but shall only consider a few of the devices for capturing or killing game devised by savage man.

In fact, savage man *perfected* the art of hunting until little

improvement was left for men in later stages to discover. It is, *par excellence*, the art of savagery. Primitive man has thought and experimented until he circumvents the wildest and overcomes the strongest animals.

Primitive methods of catching game.

It is primitive hunting when the wild man rushes upon his game, seizes it before it has time to run or fly, and dashes out its brains against a tree trunk; it is primitive hunting when he creeps silently and cautiously toward his unsuspecting prey until at last, reaching out his hand, he seizes it; it is primitive hunting when the Aztec catches the wild duck as authors have described. It seems that the old Mexicans used to leave great gourds or calabashes floating near the shores of the lake in order that the wild ducks might become accustomed to the sight and have no fear of such floating objects; then, when the time for hunting came, a similar calabash hollowed out would be inverted over the head while the hunter would cautiously and quickly move, under water, concealed below the gourd, until he reached the unsuspecting birds; seizing one of them by its legs he would drag it under water and hold it until drowned, thus preventing it from making any signal which would warn its fellows. In these cases we have imagined the primitive man as using for weapons only such as formed part of his own body.

The curved stick as a weapon.

It is a step beyond this when the Australian drags out from some hole in the rocks the lizards by means of a hooked stick, or when he throws the crooked club at his game. The curved stick is a very common weapon among low and rude folk; we know it to be very ancient and no doubt it was one of the earliest of weapons. A curved stick for killing birds was used by the old Egyptians; it is used to-day by Indians in our Southwest for killing rabbits; it was used in India and, as we know, still exists in Australia.

Savage man has learned how to use sticks of all kinds, blunt

Schooling of the savage hunter.

and sharp, pointed, light and heavy, to be held and to be thrown; he has used stone, both round and sharp, alone and attached to handles or to darts; he has devised pitfalls, snares, traps of every kind. He has exhausted his ingenuity in adapting his weapons to special uses. He has studied the life and habits of every beast in the forest and of every bird that flies over the district in which he lives and of all the fish and swimming things in the neighboring waters. The ideas which he has conceived, and which he has carried out perfectly, to capture and to kill, well repay careful study. We have not space here for such a study, but we shall look at the hunting methods of two populations very different in character and note the ingenuity displayed.

The Ainu as hunter.

The Ainu of Japan depend, to a large degree, upon the chase for food. A curious, harmless, gentle people, they are a bit of ancient life still living on into this present. Reputed the hairiest of mankind, they are notable in many ways. Upon the whole, they are a short, little people. Batchelor, who is our authority in regard to them, says: "Ainu men love inaction as far as work in the gardens is concerned. But there is nothing an Ainu loves so much as hunting, except, perhaps, getting intoxicated. They have a wild nature, which breaks out every now and then. Servants have to be allowed to go off for a day to have a good run in the fresh air or sometimes a day's horseback ride or a day's fishing." Among their chief hunting expeditions were those for deer. Deer-stalking is much indulged in. "The hunters generally carry an instrument with them on their expeditions with which to decoy deer; it is called 'ipakkani.' It is a little squeaker made of wood and fishskin, which is blown into while the thumbs are drawn over the skin; a noise is produced which sounds like the cry of the doe; the bucks are attracted by it, and when they draw near the spot where the hunter is concealed are shot." They are

The deer decoy.

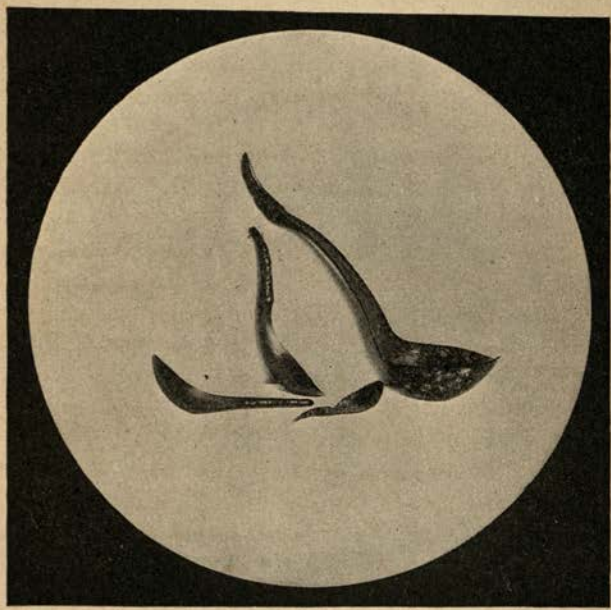

FIG. 6.—SPOONS OF HORN. Alaska.

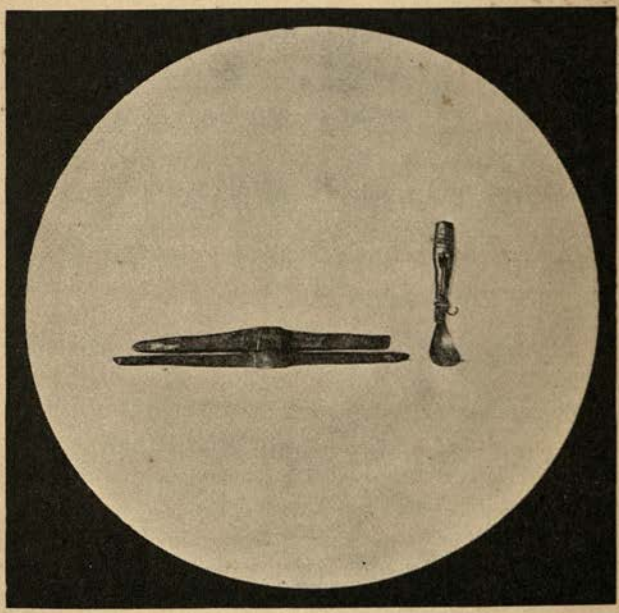

FIG. 7.—MOLD AND HANDLE-SHAPER USED IN MAKING SPOONS OF HORN. Alaska.

great people for traps of various kinds, some of which are quite ingenious. Thus, spring bows are set for killing deer and bear. A cord fastened to a post or tree crosses the trail over which the animal is expected to pass; it is attached also to a trigger which is so connected with a stout bow, drawn and with the arrow in place, that when it is sprung the arrow is shot with great force; the animal in passing along the trail strikes the string, releases the trigger, and discharges the arrow, which penetrates and causes death. Two blocks moving in grooved, divergent sticks are so related to each other and to a bow that when the bow is discharged the blocks are forcibly and instantly shot together; the creature touching the string with his paw discharges the bow and closes the two blocks. This trap is so powerful that it generally breaks the animal's leg and holds it firmly. That it may not be carried away by the captive it is usually tied to a tree or some other fixed object. There is a form of rat-trap used by these people which in principle is much like the last. It consists of an oblong box with a slide lid which is sprung shut by a bow; bait is put into the box; the animal in getting at it climbs partly over the lower end of the box and is in such position that his head and forward part of body are in the box and downward while his tail and the back of his body are outside and above; when the bait is touched, the bow-string is released, drives the lid to, and catches the animal by the body.

The bear hunt is the most important operation in Ainu life. Various methods are in vogue. It was not at all uncommon to dig a deep pit in their trail, cover the pit with rotten wood and leaves, and hang a piece of venison over it as bait. Far more commonly, however, a bear hunt was a matter in which many partook; it was almost a semi-religious affair. Before starting a meeting of the elders is held to ask the favor of the gods. They ask the god of the mountains to bring them upon

The bear hunt.

the track of the game ; the goddess of the rivers to carry them safely over the ferries ; the gods of the springs to nourish them when they drink ; the goddess of the fire to comfort them, keep them in health, cook food, dry their clothes, and warm their bodies. Whenever they rest they invoke the local gods. In the early spring, when the snow is hard enough to support walkers, the hunters start with dogs. Bear dens are recognized by a slight discoloration of the snow and the breathing hole. When a den is found, prayers are said, the snow is cleared away, and long sticks poked into the den. The dogs also try to worry the bear out. Fire and smoke may be necessary. If all these fail the hunter goes into the den, for it is said that Ainu bears never attack any one while in the den ; the bear, enraged, pushes him behind himself ; the hunter pricks him with a knife and out he rushes furiously. Poisoned arrows are at once shot into him ; they increase his rage and pain, and he is exceedingly dangerous at this stage of affairs. When a bear has been killed the hunters sit down, admire it, and make salaams. They then skin it, cut out the poisoned spots, and divide the flesh ; when the skinning is done the head is adorned with *inaos* and thanks are given. After the party returns a great feast is given.

Arrow-poison.

We have referred to poisoned arrows. They are among the most interesting features of the Ainu hunting. Batchelor says that the poison is made from the roots of the monk's-hood, which are dug up in spring, peeled, and dried. They are then powdered between two large stones ; tobacco and capsicum are soaked in water and the pounded aconite is moistened with this liquor ; sometimes a poisonous spider is added to the mixture, to which a little fox-gall has been added. To test the poison a minute amount was put upon the tongue ; if good it caused a tingling biting. The arrows were made in three sections : first, the arrow-head of bamboo, two inches long, scooped out on

one side to hold the poison ; second, a piece of bone into which the head was fixed ; third, a reed shaft. In applying the poison the arrow-head is dipped into pine-tree gum, the poison is then carefully stuck on, flattened down with the thumb, and again dipped in the gum. The bows of the Ainu were poor, simple affairs, of no particular interest. The description which we have given above of the poison-making is derived from Batchelor. B. Douglas Howard claims to have been instructed in the making of the arrow-poison among the even more primitive Ainu of Saghalien. He relates that aconite roots, carefully cleaned and scraped, were sliced and pounded to a powder. This was placed in water, and boiled until two thirds of the fluid had evaporated. It was then strained and still further reduced by boiling. The residue was placed in a sea-shell. Six dead spiders were then powdered, put into water, and boiled down. This was put in a second shell. The gall bladders of three freshly killed foxes were then taken, and the gall boiled down and put in a third shell. The two valves of a bivalve were now cleaned. In one of them the three materials were carefully mixed with a little spatula of bone or wood. The unmixed materials and the mixture were both sanctified by ceremonies before the sacred whittled sticks, or *inaos*. After testing the mixture by dipping the tip of a spear of grass into it and touching it to the tongue, the upper valve was adjusted to the one containing the poison and the edges were gummed together.

The use of dogs.

The Ainu have but a single domestic animal, the dog. The Ainu dog has been trained for use in hunting. In the stalking of deer, packs of them would refrain from attacking and killing the game, but would stand by and keep it at bay until the hunters came up and shot it with their poisoned arrows.

B. Douglas Howard tells an astonishing story in regard to the help of dogs in fishing. "A fishing party started for the

sea with about thirty dogs. Arrived at the scene of action, dogs and men were separated into two parties stationed at points two hundred yards apart. At a given signal the dogs plunged boldly into the water and swam out single file in two columns. At a signal they wheeled toward each other, and when they had completed a crescentic line turned in toward the shore. As they drew near the land and the line contracted, fishes were driven into shallow water. Here the dogs seized them and brought them to their masters."

Hunting among the Central Eskimo.

Boas, in his most interesting and valuable paper upon the Central Eskimo, tells us something in regard to their hunting life. Besides deer, musk oxen and bears are hunted or trapped in various ways. Small game of many kinds is taken in traps, differing in construction, or shot. A few exceptional and curious methods only will be described: "A sharp knife is smeared with deer's blood and placed upright in the snow. Wolves lick the blood, cut their tongues, and bleed to death. A strip of whalebone about two feet long is rolled up into a coil, tied with sinew. At each end a small metal edge is tied. The strip, wrapped in a piece of blubber or meat, is swallowed by a wolf. The sinew dissolves, the strip uncoils, and tears the stomach. Waterfowl are caught in abundance in whalebone nooses fastened to a long whalebone line or to a thong and set in a lake, along the edge, particularly near nesting places. To catch gulls, a flat snow-house is built with one block of the roof translucent and thin enough for the hand to be passed through it. The hunter, concealed in the house, grasps the bird descending to catch a bait placed on this. Many birds are caught while moulting; partridge may be caught by hand, and waterfowl are pursued with the kayak. Waterfowl, kept diving, are drowned. One species of goose is caught thus: A circular wall of stones is raised, with but one entrance. The Eskimo drive a flock of the birds toward it;

Traps and snaring devices.

these stupidly follow a man into the entrance, which is then closed and they are killed. On the water they may be encircled by kayaks and follow a leading one to shore and to the construction described.

"Deer-hunting is chiefly done when the snow is melted. The favorite mode is to attack the deer as they swim across lakes or ponds. When in migration, deer have trails; hunters lie in ambush with their kayaks. Elsewhere they are driven into the water by Eskimo and attacked by hunters, stationed on the lake. Favorite spots are peninsulas of narrow breadth. The deer are driven onto these and then into water. Where a straight shore does not permit this they drive the deer to a hill stretching to the lake. A line of cairns is erected on top to deceive the deer, who think them other men lying in wait; they take to the water. Such cairns may even be erected in line on the open plain. Such, some apparently very old, are found all over the country. The deer, once in the water, are pursued in kayaks and quickly dispatched. Narrow valleys between high ridges are natural game drives. Where firearms are not in use bows and arrows are taken. Deer-hunting.

"In winter the seal takes to the smoother parts of the floe, a few miles from the coast, where it scratches breathing holes through the ice in which it rises to blow. It shuns hummocky ice and floes of more than one year's age. To capture them the hunter stands with his *unang* at the holes to spear the seals. The *unang* now used in Baffin Land and on the west shore of Hudson Bay consists of a wooden shaft into which an iron rod (*unartenga*) is sunk: the latter is pointed at the end. The socket is secured by a small ivory ring or a string wound around the end of the shaft. Into the socket, close to the iron rod, a bent nail is inserted, forming a narrow eye. Near the center of the whole implement a small piece of ivory is fastened to the shaft, for a hand-rest in throwing. At the lower end of the Seal-hunting.

shaft a string of deer sinews or a thong is fastened, forming a loop which passes through a hole drilled through the shaft. A stout iron point is also attached to the lower end of the shaft. The instrument is of general utility, not only in shooting but also in cutting, and the head is practically copied from the old type.

"At daybreak the Eskimo begins to prepare for the hunt. The dogs are harnessed and the implements are fitted up. The harpoon and snow-knife are hung over the deer's antlers, a seal or bearskin is lashed over the bottom, and the spear secured under the lashing. The hunter takes up his whip and the dogs start. When arrived near his hunting-ground the hunter stops the team, removes the implements, and turns the sledge upside down, pressing the runners' tips and the antlers into the snow. A good scenting dog then takes the hunter to a seal's hole. In winter it is entirely covered with snow, but a small elevation usually indicates the spot. The dog is led back: then the hunter carefully examines the hole to see if recently visited. He cautiously cuts a hole through the snow covering and peeps in. If new ice is there, the seal no longer visits the place. If all is well, the hunter marks the exact center of the hole on top of the snow and *carefully* fills up the peephole with small blocks of snow. No hair from clothing must fall in the hole or stick to the snow, or the seal will smell. Loose snow is heaped up around the harpoon point placed directly upon the central spot. When the harpoon is removed a hole remains as a mark for the harpooner. The hunter places a small piece of skin, usually that of a young seal, close to the hole to stand upon. He fastens the *naulang* to the harpoon shaft, while the lower end of the line is folded up in a coil which he holds with his left hand. The *unang* is held in both hands, and sometimes the man remains for hours, occasionally stooping and listening, until he hears the blowing of the seal. Then suddenly he

stands upright, and with all his strength sends the harpoon straight downward into the hole, paying out the line at the same time, but keeping a firm hold of the loop at its end. Presently he can haul in the seal, which is usually struck near the head.

"When the hunter expects to have to wait long for the seal, he builds up a semicircular wall of snow-blocks to keep off the cold wind, and makes a seat in the center of it. A skin is spread underneath his feet, and his legs are tied together with a thong, which is fastened by a peculiar kind of buckle, with two holes. One end of the thong is firmly tied to the buckle passing through one of the holes, while the opposite end passes tightly through the second hole. The thong may be quickly opened by a strong effort on the part of the hunter, while it helps to keep him quiet. At his right hand his snow-knife is stuck into the snow, while to the left the *unang* is placed on two pegs. The line is coiled in his lap. His left arm is drawn out of his sleeve that he may more easily keep warm. Both sleeves are generally held together by a piece of deer's horn, with a branch on each side that serves as a hook. Thus he waits until he hears the breathing of a seal. As it usually stays several minutes he makes no haste. Cautiously he puts his left arm into his sleeve, which he has unhooked. He takes hold of the coil, lifts his *unang*, rises, and strikes. . . . . As soon as captured the wounds are closed with plugs: a hole is cut through the flesh below the lower jaw and a thong passed through the hole and the mouth. The seal is then dragged to the sledge, covered with the bearskin, and securely lashed down. It quickly freezes, and the hunter sits down upon it. If the seal happens to blow soon after his arrival a man may secure a second one, but usually one is a full day's game.

"In March, when the seals bring forth their young, the same mode of hunting is pursued: the young seals also are eagerly hunted. The pregnant females make an excavation from five

to ten feet long under the snow, the diving hole being at one end. They prefer snow-banks and rough ice or the cracks and cavities of gorged ice for this purpose, and pup in these holes. The Eskimo set out on the hunt on light sledges dragged by a few dogs, which quickly take up the scent of the seals: arrived at the hole they stop. The hunter, jumping from his sledge, breaks down the hole roof as quickly as possible and tries to intercept the seal. Generally the mother escapes but the pup is caught. It is drawn out with a hook and killed by firm stepping on its breast. Sometimes the hunter ties a thong to the hind flipper of the pup and throws it back into the hole; it dives, crying pitifully; when it comes up to breathe the hunter may push it back. Frequently the dam comes to try to draw it away, whereupon she is speared, dragged out, and killed.

"In June seals are more easily caught than in winter. The hunter approaches the basking seal from the windward side until within seventy to eighty yards. Fastening a piece of skin under his left arm he reclines upon it and creeps along prostrate: the skin protects from melting snow, facilitates speed, and diminishes noise. He moves on, pushing himself along by his right foot and left arm. Whenever the seal looks around to see if there is danger, the hunter lies flat, or if *near* acts like a seal, raising his head and rolling and playing with his hands and feet. Some hunters imitate the noise of a blowing seal, or have a little white screen on a sledge, which conceals them as they approach. While the seal naps, a few minutes only at a time, the approach is slow. When near enough the gun is fired and the harpoon hurled. When the snow is hard and water has not appeared on the top of the ice, a seal may be killed this way in twenty or thirty minutes. If the snow is very soft or deep the approach is difficult or impossible. After the shot is made the Eskimo at once jumps to his feet to prevent

the escape of the animal to its hole. An expert hunter may kill from ten to fifteen seals a day in this manner.

"Still later in the season a successful method is used. Men, women, and children all go out and occupy every seal hole over a large area. The men keep their harpoons ready to strike the seal when he rises to blow: the women and children with sticks frighten the seals away when they try to rise at *their* places. As the animals must rise somewhere, an ample supply is produced in a short time."

What skill in hunting shows.

We have described the hunting of the Ainu and the Central Eskimo thus fully as we desire to show how ingeniously savage man has solved the question of how to get the better of the shrewd and wily animals. It is no small achievement to so fully learn the habits of the lower creatures and so exactly meet and overcome them. This ingenuity shows itself as well in the traps and similar devices as it does in the weapons. How many, many years, and how many, many experiments were necessary before the Ainu could learn to make his arrow-poison. Another point to notice is the perfect way in which man adapts himself to his surroundings. It is often asked why at this late day we find still living in the world savage and backward peoples; the answer very often may be found in the physical surroundings. There are districts where savage man is much better adapted to his surrounding than civilized man would be. To every one but the anxious Christian propagandist the sight of the perfect fitting of the Eskimo to his Greenland environment must be delightful. Houses, dress, boats, weapons, actions, thought, religious conceptions—the whole of life is perfectly adapted to the country. Change means death. Hear what Nansen says of the Greenland Eskimo:

Savage adaptedness to surroundings.

"It is a gallant business, this kayak-hunting: it is like a sportive dance with the sea and with death. There is no finer sight possible than to see the kayak-man breasting the heavy

rollers that seem utterly to engulf him. Or when, overtaken by a storm at sea, the kayaks run for the shore, they come like black storm-birds rushing before the wind and waves, which like rolling mountains sweep on in their wake. The paddles whirl through air and water, the body is bent a little forward, the head often turned half backward to watch the seas; all is life and spirit—while the sea around reeks like a seething cauldron. And then it may happen that while the game is at its wildest a seal pops its head up before them. Quicker than thought the harpoon is seized and rushes through the foam with deadly aim; the seal dashes away with the bladder behind it, but is presently caught and killed, and then towed away. Everything is done with the same masterly skill and with the same quiet demeanor. The Eskimo never dreams that he is performing feats of heroism."

CHAPTER VII.

Cultivation of Plants.

There is absolutely no agriculture among the Australians, who do not even lay by a stock of the poor foods which niggard nature gives them in that backward continent, but eat up all they find in one place and then migrate. Among the Bushmen and the Hottentots, also, there is no cultivation of the soil; with digging sticks weighted with heavy stone rings they dig up roots and tubers, but they plant no seeds that new roots and tubers may grow.

Absence of agriculture.

There can be no question that it was the woman, left at home to tend the fire, who was the first agriculturist. The kindling of the fire, as we have already said, led to the first division of labor—a division between sexes. The results have been wonderful. While the man was hunting for game or fighting against his fellows, the woman by the fire, trying to piece out the scanty fare with roots and stems, barks and leaves, which she could find about the home, began the various peaceful industries of life. She was the basket-maker; it was she that devised pottery; she first spun fiber into thread, wove threads into fabrics, cut cloths and skins and made them into clothing; it was she who worked out many of the mechanical trades to practical applications; it was she who began the cultivation of plants; it was she who first tamed animals. Professor Mason has gone so fully over the whole matter of "Woman's Share in Primitive Culture," that we need not dwell more fully on it here.

The woman the first agriculturist.

Some first steps.

In wanderings for roots and fruits she came upon some plant particularly noticed on account of its good promise; for fear some careless hunter might trample it under foot or that some animal might steal or harm the fruit before it ripened, it would be protected by a few sticks set about it. That it might have a better chance to grow and bear its fruit the plants around it which prevented it getting full share of air and light would be cut away or plucked out. This was the beginning of care for plants. Again, some young and sprouting plant distant from the fireside would be transplanted in order that it might be more accessible in time of need. Still later would come the idea of saving seed for planting, and with this idea the clearing of the soil and true agriculture.

Simple but efficient agriculture.

While agriculture began with woman, and in savagery or lower barbarism, it only reached its full development much later, after man had taken it up and, by irrigation and the help of beasts, perfected it. We see this later, fuller development in a simple form among the old Egyptians, the dwellers in the two valleys, and the Chinese. In the life of roving nomadic tribes with flocks and herds it is not uncommon to leave the old and feeble men and women and the children behind in village settlements while the men swarm out to hunt and pillage. Meantime the women gather stores and may, if time allows, raise a new crop. After harvest, all move to some new village site. The Phœnicians on their slaving voyages used to land and raise a crop, then pass on upon their journey.

Agriculture of nomads.

Cultivated plants travel.

When a really useful plant had once been brought under cultivation it would be carried with a tribe in its migrations. The grains, no doubt, arose in Eurasia; and have been carried around the world. Corn or maize, a native of our continent, has spread over the globe. When New Zealanders settled in their home they brought their chief food plants with them from their old abode. Many people whom we are in the habit of

considering mere wild hunters had some agriculture; there were few, if any, tribes in North America east of the Rocky Mountains and south of the limit of almost continuous winter who did not raise some crops. All early travelers tell of the gardens of the Iroquois and Algonkin tribes along our eastern seaboard, and it is well known that the settlers of New England must have starved, if they had not been helped from the supplies of the Indians. Among the southern tribes, such as the Creeks, agriculture was still more developed. In Mexico, Central America, and the Greater Antilles abundant crops were raised. Throughout this latter district the methods certainly were crude, the only instrument being the pointed stick; beans, gourds, batates, manioc, and corn were raised. The only flesh food among some of these people consisted of little dogs, which were regularly fattened for eating.

North American Indians as agriculturists.

The first and simplest agricultural tool was a sharpened stick for digging up roots. This was sometimes weighted with a stone, as we have described, among the Bushmen and Hottentots. This first simple tool is used not only as a digging stick, but also for drilling holes in which to plant seeds; such is its use in Nubia, Yucatan, the Antilles, Sweden, and many other places. Corn-planting in Central America was and is a very simple process; a man going first with his drilling stick, makes a hole in the ground; his wife following after drops in a few seeds of maize; little people, following after these, with their feet cover the grain thus sown with the earth which was loosened by the stick. Of course, a broader implement like an oar or paddle is much better for working soft soil, and many a simple wooden spade might be found in use among lower populations. A bent stick or a branch with an offshoot trimmed down makes a primitive hoe. The Delaware women were not the only ones who have used the broad shoulder-blades of animals for spades and hoes. In certain parts of

Agricultural tools.

Illinois and Missouri great, broad, long blades of chert, carefully chipped, are found; they were, no doubt, formerly lashed to handles, either in a line continuing the shaft or at an angle to it—the former hafting gave a spade, the latter made a hoe. Notwithstanding the exceeding hardness of the stone from which these blades were made, the use of them in fine earth has worn their edges to a perfect polish. The old Egyptians had a kit of very simple tools for agricultural purposes. The bent stick hoe was one; the sickle for cutting grain when grown was the jawbone of some beast with sharp bits and edges of flint or chert inserted in the groove where teeth had been; later on the jawbone was replaced by a wooden frame in which the flint edges were cemented; the early Egyptian plows were really nothing more than their hook hoes of wood made large for dragging by cattle. The wooden plow developed from this, but with better handle, may be seen throughout Old Mexico to-day. To us such devices look awkward, but to the Mexican, accustomed to them, they seem fit and convenient. Would-be philanthropists have taken to these people some of our best modern plows, with great steel shares and with two handles; it is all the same to the staid Mexican, who simply cuts off one of the handles and then goes on with it just as before.

Threshing.

The first threshing must have been a very simple thing. The Indian women on the Illinois River, at an early day, simply bent the stalks of wild rice over the edge of their canoe and with flat paddles beat the heads until the seeds fell from them into the boat. Fire no doubt was used by women of many primitive folk to get the useless husk off from the grain and seeds. After animals were tamed and reduced to use they would be brought into service; thus among the Pueblo Indians in the Southwest, threshing is performed as follows:

A circular area some yards across is cleared and smoothed

and covered with a firm floor of beaten or hard-trodden clay. This floor is enclosed by a circle of poles set in the ground, and connected by means of ropes or cords. The grain to be threshed is cut and brought in from the fields; it is heaped up, upon the threshing floor; a drove of ponies is turned into the enclosure and kept running around and around by a man who stands in the center with a whip. Soon the motion of the many hoofs upon the straw shakes the grain from the husks; the horses are let out, and men go in with great flat wooden shovels and with pitchforks, by means of which they toss the straw up into the air. This is done only when the wind is blowing briskly. As fast as the straw is thrown into the air it is carried off by the wind, while the wheat or other grain, separated quite completely from the straw and chaff, falls back upon the floor. At length it is heaped up in piles. Women come with great baskets with flaring sides; filling these with the grain, which still contains a little chaff, they raise the baskets high above their heads, tip them slightly so that a little stream of grain flows in a steady fall from the basket, dropping upon a canvas spread upon the ground to catch it. At the same time the woman gently shakes the basket from side to side. As the grain falls the wind carries away the last particles of dirt and chaff and the grain is clear. Such is one form of primitive threshing and winnowing.

Winnowing.

It is not altogether easy to decide what should be called the perfection of agriculture. If by perfection of agriculture we mean ability to do things upon a gigantic scale; if we mean the plowing of a field miles in length by means of great steam plows; if we mean the cutting of the fall harvest by means of mammoth reapers, standing side by side and drawn by fine, great teams, it is plain that we ourselves have reached the highest point of agriculture, in the wheat-fields of our great Northwest. There is, however, another way of looking at the

What is perfect agriculture?

matter. One might mean by perfect agriculture the ability to compel each little piece of land to do its utmost in the way of producing food for hungry mouths. The former wholesale method requires complex machinery, itself a triumph of inventive genius; the latter may be done with the crudest tools and simplest methods. Every piece of work must be judged by its adaptedness to local conditions, and to individual surroundings. If we judge of agriculture in this way, we shall find the most perfect, although very simple agriculture, among the ancient folk of Egypt and among the modern millions of China. For in China we have the greatest yield wrung from the soil; in China we have every available inch of ground in use; in China we have no wild plants, no weeds, but one great kitchen garden.

Simple but effective modes pursued in China.

Miss Fielde, in "A Corner of Cathay," says: "The farming appliances are simple and a complete outfit can be bought for forty dollars. A plow with two shares, a pair of harrows, and a fanning mill each cost two dollars; a pump worked by treadles in irrigating the fields, four dollars; a water buffalo, twenty dollars; hose, sickles, baskets, and sundries, ten dollars. The chief expense of tillage is in fertilizers, beans and seeds from which the oil has been expressed being commonly used, at an outlay of from six to forty dollars, an average of twenty-four, upon every acre of land. Besides this, potato peelings, hair from shaven heads, and all other vegetable and animal refuse is carefully husbanded and methodically applied to the soil. The clods of the field are laid up into little ovens to retain and to be enriched by the smoke of the stubble burned underneath them. Adobe houses whose walls have for many years absorbed the fumes of a kitchen and the exhalations of human inhabitants, are pulverized and added to the hungry earth. Each growing plant separately receives distinguished consideration, a scrap of tobacco stalk being sometimes put beside its

roots to destroy the underground grubs, while its leaves are frequently examined and sedulously freed from vermin. The rotation of crops is also practiced. . . . . One acre tilled by the peasant proprietor alone will feed six persons—the peasant, his wife, his aged father and mother, and his two young children. It will yield rice, hulled in the house, and vegetables, raised between rice crops, sufficient for food. The straw and the stubble will serve as fuel, and the pig and fowls will supply meat. The clothing will be woven and made by the wife, while the old couple take care of the children."

With such rude tools and such painstaking methods the Chinaman produces astonishing crops. "At this rate of production and consumption, the arable land in the state of New York, with a reduction of half its returns on account of its more northern climate, would support the total population of the United States at the present time; and the occupied arable land of the United States, with its producing power diminished, on account of climate, to one half of the land at Swatow, would feed a population equal to that of the whole world, or over 1,400,000,000."

CHAPTER VIII.

CULTIVATION OF PLANTS; ORIGIN OF FRUITS AND VEGETABLES.

Man has made our fruits and vegetables what they are to-day.

IN THIS chapter we shall consider man as a creator. Many of the most beautiful things which we see about us and which we are fond of looking upon as wonders of creative power are made by man. Nature after all is a very niggard; she gives, but it is to the industrious worker that she gives. The wild roots, tubers, stalks, leaves, seeds, nuts, and fruits which primitive man had offered him, we would think to-day, if they were offered us, were scarcely worth the taking. Roots and tubers thin and hard, bitter, poisonous—such the poor people of the past dug from the earth; the stalks which sufficed to allay hunger in time of need were often tough, the fruits stringy, astringent.

The cabbage.

When we visit a vegetable garden or see the fresh, attractive fruits offered in market or inspect the wonders shown upon the tables of county fairs and agricultural shows, we seldom realize how truly they are all the work of man. For notice such a plant as the common cabbage. It was probably a native of the continent of Europe. No doubt, at first, its leaves attracted notice and were used as food. Taken for its somewhat thickened leaves, it was grown with care until, in course of time, it came to give the great heads that we now know well, and which are highly prized; but surely nothing comparable to these ever grew in nature. But not only could its leaves be eaten; its root was also useful. Man desiring a richer and

richer root product took the plant, and caring for it, produced from it the turnip. Hunger and varying taste led him to notice that not only might the leaves and root be eaten, but that the flower cluster also was more or less nutritious; improving it he got the cauliflower. Thus from a single wild species, by paying attention to the different parts he wished, selecting, improving, changing, man produced three such totally different forms.

The potato in its wild form produced tubers of small size, very bitter and tough. The old Peruvian took what nature gave him and by care improved it. The plant which he prized he passed along to others until, when Raleigh visited Virginia, eastern Indians were cultivating the plant—still small and relatively of little value. Taken to England it was rapidly improved; it lost its stringiness and bitterness; was increased in size and mealiness. To-day if one compared the original form with the many choice varieties raised in gardens it would be difficult to believe the two really the same plant. The potato.

The same is true, of course, of fruits. It is an easy thing for any one to compare the wild grapes, which nature supplies, with the great clusters of our improved varieties; the wild crab-apples on their ugly crooked trees are very different from the great pound sweets and northern spies of present cultivation; the gooseberry under cultivation has multiplied its weight many times over. One of the most wonderful illustrations of what man can do in changing nature is seen in the case of the peach. Some time, long ago, perhaps in Western Asia, grew a wild tree which bore fruits, at the center of which were the hardest of hard pits, containing the bitterest of bitter kernels; over this hard stone was a thin layer of flesh—bitter, stringy, with almost no juice, and which, as it ripened, separated, exposing to view the contained seed; such was nature's gift. Man taking it found that it contained two parts which might by proper treat- Fruits. The peach.

ment be made of use for food—the thin external pulp and the bitter inner pit. He has improved both. To-day we eat the luscious peaches with their thick, soft, richly-flavored, juicy flesh—they are *one* product of man's patient ingenuity. Or we take the soft-shelled almond with its sweet kernel; it is the old pit improved and changed by man; in the almond, as it is raised at present, we care nothing for the pulp and it has almost vanished. The peach and almond are the same in nature; the differences they now betray are due to man.

The cereals.

Among the very earliest of plant products which man perfected, and which he still makes use of, are the different kinds of cereals—oats, rye, barley, wheat. They are much older than the pyramids. They were known to ancient Chinese. They have been cultivated so long that man forgets where they began. They exist in hundreds of varieties. They supply the chief food product of the world. They were cultivated by the old Lake-Dwellers in Switzerland, and one still dredges up from the bottoms of the blue lakes of that mountain-land bushels of barley and loaves of ancient bread.

The original home of our chief food plants.

All parts of the world make contributions to the modern table. Primitive man in every land and continent—except, perhaps, Australia—found some plant in his environment which he could use for food and which he found better by improvement through cultivation. How many places are represented! The radish came from Asia; the turnip, carrot, cabbage, cauliflower, from Europe; the onion is a native of Western Asia, perhaps of Persia, Afghanistan, Beloochistan; celery was widely spread and came from much the larger part of Europe, North Africa, and Western Asia; artichokes are truly Mediterranean, growing wild in Southern Europe, Northern Africa, in the Canaries and Madeira; lettuce also came from about the great interior sea; asparagus, which must at first have been a rather stringy stalk, is European and West Asian; the berries

which we cultivate came mostly from the temperate regions of Europe and of Asia; the cherry, plum, and apple came from south of the Caucasus or further east; the apricot and peach are Chinese; the grains, as we have said, are only doubtfully located, but perhaps they came from Western Asia; olives came from Syria and the adjoining lands; while melons seem originally to have been tropical fruits. It will be noticed that by far the greater part of our valuable food plants have come from Asia and from Europe; Africa follows next in the value and importance of its food-plant gifts to man, and last of all that deserve any mention comes our own great land, America. The potato, native of Chili and Peru, the sweet potato, perhaps from tropical America, the plant which yields chocolate, and the tomato, are gifts from America to the cupboard of mankind.

De Candolle is the authority.

Thus we see what mankind has done through cultivation of plants. In wide and anxious search he has found here and there poor food supplies, which he has taken and, little by little, improved and modified.

CHAPTER IX.

DOMESTICATION.

Value of permanent food supply.

FROM an uncertain and precarious to a permanent and regular food supply was one of the main features in development of civilization. We have already seen how men began to provide certain food for themselves by taking care of plants; they have accomplished the same end by domesticating animals. While the beginning of both cultivation and domestication is to be looked for in savagery, it is fully recognized that the full development of domestication precedes the full development of agriculture; in other words, pastoral life appears naturally to precede the settled life of agriculturists.

Beginnings of domestication.

The beginnings of domestication came when the hunter, having wounded but not killed his game, carried it with him alive to the home; other food being at hand the creature was left to live until a time of need. The holding of animals in captivity is to be found among very many rude peoples at the present time; some of the South American Indians are known thus to keep birds and animals as simple pets; of course, such pets are sacrificed in time of need. In the same way the Pueblo Indian keeps eagles in cages and when he needs fresh feathers plucks them from the living bird. In such cases as these there is not always any special effort to tame the captive, nor is there often an idea of training it to use.

It is also a step in the direction of domestication when the hunter leaves a creature, which he sees, unharmed, thinking to kill or capture it upon a later day. In the days when Indians

hunted buffalo upon our western plains the whole village migrated with the herd. To live beside a herd of wild animals is not domestication; but there is only a step from the following a moving herd to enclosing and surrounding creatures in some natural area; thus the old Egyptians seem to have had game preserves, upon the animals within which they depended for their food. Out of such things as keeping wounded creatures, raising curious forms for pets, sparing the creature seen to-day until to-morrow, living beside the herd, enclosing great areas within which beasts live, came gradually the idea of breeding animals, raising young, and really living off of herds kept constantly in captivity.

Domestication of the dog.

The domestication of animals dates far back into the past, and there are good reasons for believing that the dog was the first form domesticated. It is very difficult to answer all the questions that are asked in regard to the dog as a domestic animal. Looking upon the different forms now kept, it seems impossible that all of them have come from any single form, and the question whether our tamed dogs should be considered as descendants of one or several species has been much discussed. It seems, on the whole, that several species of dog-like animals have been tamed in different parts of the world, by different peoples, at different times. Thus Darwin says: "It is highly probable that the domestic dogs of the world are descended from two well-defined species of wolf and from two or three doubtful species; from at least one or two South American canine species; from several races or species of jackal; and perhaps from one or more extinct species."

The original form.

De Mortillet, while recognizing the probable diversity of origin of our domestic dogs, is inclined, on the whole, to look far more to jackal-like forms for ancestors than to wolves or foxes. Thus he says: "In fact the jackals—we speak in the plural because there are several species or races of them—are much

more sociable than wolves and foxes. They do not fear to approach human habitations, penetrating into the court and even entering the tents to snatch anything they desire; they are very importunate. They are easily tamed and attach themselves to their master, but remain very timid and fearful. They are not afraid of mingling with domestic dogs and in place of avoiding them they couple with them easily. The jackal has a strong and unpleasant odor, but in captivity loses it about the third generation. More, the jackal, which yelps, brought into contact with dogs that bark is not slow in learning to bark also."

Widespread occurrence of domestic dogs.

Although De Mortillet is thus inclined to trace the dogs of Europe back to species of jackal, he recognizes that in other parts of the world various wild dogs may have been tamed. One of the most remarkable things in regard to the history of the dog is the way in which he is found in domestication over the whole earth; wherever man has gone, there this faithful companion is found with him. Be it in the icy north, he drags the sledge for the Eskimo; in ancient Egypt he assisted in the hunt; among the Aztecs he was fattened for food. The dog certainly existed as a captive animal in America long before the discovery. In the north the Eskimo, further south the hunting Indians, in Mexico various tribes, in the West Indies and in South America people of many different stocks seem to have used him as a friend, a fellow in the hunt, or otherwise. So, in Oceanica, he was found by Cook and other early travelers. In New Zealand, he was almost the only mammal. In that very backward continent, Australia, where man remained at almost the lowest level, we find again the dog. This time it is the dingo, native to the continent, which is tamed, or partly tamed, by the wild, dark man.

Suggestion as to how the dog became domesticated.

The jackals and these other wild dogs were hunters, going in packs. It is likely that the dog is the only one of all our domestic creatures that can be said to have been really tamed

FIG. 8.—ESKIMO SPEAR-THROWER.

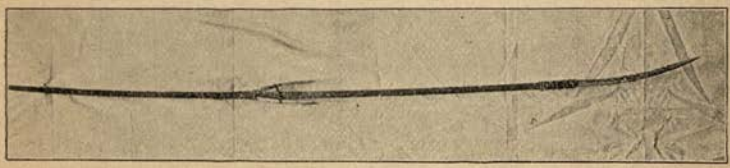

FIG. 9.—ESKIMO BIRD-SPEAR.

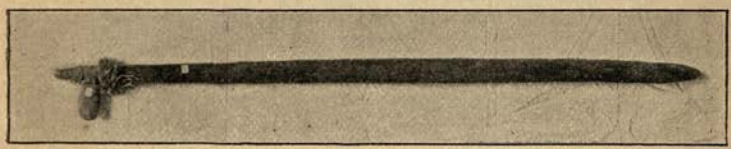

FIG. 10.—CEREMONIAL AXE OF STONE, MOUNTED. Paraguay.

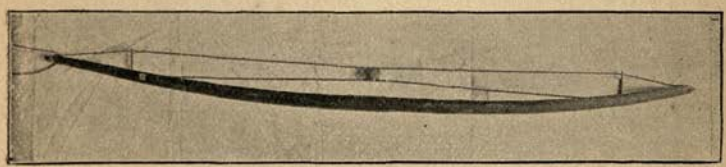

FIG. 11.—PELLET BOW. Paraguay.

by *man;* the others were domesticated by woman. It seems as if some such a history as this took place: The wild men hunting in bands for game were followed by packs of wild dogs. Wounded beasts trying to escape were stopped and pulled to the ground by the dogs, whereupon the wild hunters, rushing up, drove them off and seized the booty; what the men did not want was left behind and quickly devoured by the dogs. Thus there grew up a certain sort of friendship and companionship, a mutual helpfulness between the partners, man and beast. In any band of dogs there would surely be a few of unusual bravery and shrewdness, quick in action and playful, more inclined to come close to the camp of the hunters in the night. Gradually, between such dogs and the men there would grow up a more friendly relation, which in time might even come to be so close that the dog was tamed and attached himself by preference, with a few companions, to the men rather than run wild with the pack.

The dog in ancient Denmark.

In certain localities, the archæology of which has been studied with great care, there seems to be evidence that the dog was domesticated, while no other animals had yet been brought into that state. Thus, in the *kitchen-middens* of Denmark the bones of dogs are found associated with the bones of many other animals, which were plainly wild and hunted for food. The *kitchen-midden* is a heap of refuse, marking the site of the camping-place of old-time people. In Denmark they consist mainly of the shells of oysters, clams, and other mollusks which were used for food. Scattered through these shells are bones of birds and beasts, and fish used for food. The *kitchen-middens* of Denmark certainly date back to an early period; they represent what is commonly called by students the early Neolithic period. The relics of man's handiwork found in them seem to show that the inhabitants of Denmark at that time knew nothing of the use of metals and lived

as wild hunters, comparable to the Tierra del Fuegians of the present. It is plain that the animals whose bones are found scattered through these heaps of refuse were mostly killed in the chase. Was the dog, whose bones occur also, wild and hunted, or was he tamed? Steenstrup answered the question in the following way: He found that the smaller bones of most of the animals had disappeared and that the larger, long bones had been gnawed at both ends; he thereupon took dogs, shut them up, and fed them with carcasses of wild game. After a time the bones left were carefully examined; it was found that the smaller bones had disappeared, having been eaten with the flesh by the dogs; the larger, long bones were left but were gnawed at both ends in exactly the same way as those from the shell-heaps. It is plain, said Steenstrup, that the dogs lived about the camp, devouring what the men did not use, eating the small bones and gnawing the long ones; hence, it seems that the dogs whose bones are found were probably domesticated, and not simply beasts that had been killed for food.

Our domestic forms come from many regions.

The inmates of our barnyards are an assemblage brought from the four quarters of the globe. The guinea-fowl, the common hen, the turkey, came from three different continents. Much care and time had been spent by authors in endeavoring to find exactly what the wild forms of our domestic animals and birds were, and where they lived. We have already referred to the question in so far as it relates to man's oldest friend and servant, the dog. The cat, which, by the way, has little to commend it, and which has scarcely, after thousands of years of petted life, got over its wild and unhappy disposition, perhaps came really, at the first, from Egypt. Old drawings on the monuments and mummied bodies found in tombs in that strange seat of ancient culture show us—so Darwin says—no less than three species. Two of these still live,

The cat.

both wild and tamed, in Egypt. There are, of course, wild cats in many parts of the world, and it has been observed that they frequently interbreed with the domestic forms, but it seems safe to look upon Egypt as the domestic cat's first home.

The horse has given rise to volumes of discussion. Wild horses have lived at one time or another in several continents. Many, many thousands of years ago several species of the horse lived in Western North America; conditions were then very different from those now prevailing in that district and probably man had not appeared upon the earth. At all events, when the first explorers visited our continent, wild horses were not known in America, and those herds which now roam at will over some of the great plains in South America have descended from ancestors that were brought from Europe. The horse was killed for food in France thousands of years ago. At one locality—Solutré—it must have been a most important food supply, as its bones are there piled up in great heaps, many meters in length. Solutré was a camping-place for early man long before the shell-heaps of Denmark accumulated. At that time the reindeer still lived in France; the climate was very different from the present, and other conditions were unlike those now prevailing. Were these horses wild or had they been domesticated? We have not space to give the argument but on the whole agree with De Mortillet, who claims that the Solutréan horses were game, not stock. Almost as far back as the Egyptian records go, we find the horse in use. In China, too, are records of its presence as a tamed animal for thousands of years. The horse.

In Africa no wild horse so closely resembles the domestic form as to suggest relationship; in China it is distinctly stated by the ancients that the horse was introduced into that country; consequently, the original home of the wild form was probably neither Egypt nor China. De Mortillet says: "The horse

can only have been domesticated in some district where it was wild. But the region of the wild horse extends across the whole of Europe and Asia. It certainly, then, forms a part of the Eurasian domestication. In the great zone which traverses Europe and Central Asia wild horses still existed in the times of the Romans. The north produced troops of wild horses, Pliny says, the same as Africa and Asia produced troops of wild asses. By Asia the Latin author meant Southern Asia. It is, indeed, in Central Asia that one meets at present truly wild horses." A Russian, Prjevalski, in a journey in that desert, which extends between the Altai on the north and the Thian-shan on the south, limited on the west by the mountains and on the east passing into the Desert of Gobi, discovered a wild horse of which he sent to the museum at St. Petersburg a skin and skeleton and two or three skulls. It is called the *Equus Prjevalskii.* This wild horse found by the Russian traveler seems to be more likely the ancestor of our domestic animal than any other species yet discovered. It is little, stout, thick-necked, and of a dun color. The ass was early tamed and made of use in Egypt, where, as well as in Palestine, Greece, and Italy, it was a favorite. The wild form, which resembles very closely the domestic, is found to the present day in Abyssinia. We are so prone to look at this creature with disrespect that it is hard for us to realize how highly it was esteemed by the Semitic peoples generally. As for the mule, that despised mongrel, a cross between the horse and ass, there have been times in Italy and Greece when it was considered far more beautiful and stately than the finest horse.

Prjevalski's horse.

The ass.

The pig might well have been left undomesticated. As a matter of fact, it was early tamed and seems to have come from more than one source. Thus, Darwin quotes that two distinct types were plainly present in Europe at a very early day; the larger form seems to be merely a tame descendant of

The pig.

the wild boar. The domestic pigs of other countries in the same way seem to have come from boars, which still exist in a wild state in those districts. De Mortillet says: "That which shows plainly that the domestic pigs have come from boars is that in every region they bear a certain relationship to these. Thus the boar of Europe is the largest species of wild boar; the domestic pigs of Europe are also the largest and strongest of domestic types. In Asia are boars of three species which are much smaller than the European; the domestic pigs of Asia are also much smaller. Finally, the Papuans have also a domestic pig which is entirely analogous to their wild form, so that travelers and naturalists agree that it is the same animal." Cattle, sheep, and goats have, in the same way, been domesticated at different times and different places. Several wild forms exist in Europe and Asia, which may all be parent types.

Cattle, etc.

We have referred only to those domestic forms which are used, and commonly, among ourselves. We owe them to the industry and sense of old-time peoples in various parts of the world. It would have been interesting to have considered the domestication of other forms, such as the camel, llama, zebu, buffalo, etc. It would be interesting, too, if we had space, to present a picture of the farmyard contents of some rude peoples, old or modern; thus the ancient Lake-Dweller of Switzerland was supplied with a variety of domestic animals—dogs, cattle, pigs, etc.—and many of the modern Africans are well supplied.

Domesticated animals of other peoples.

As under cultivation of plants we had occasion to consider man as a creator, as there we saw what wonderful results may be produced by selection and cultivation of vegetable forms, so here we may see how, either for his pleasure, his amusement, his comfort, or his use, man has changed and varied what nature presented to him. The difference between the wild boar of Europe and some of our high-grade, fat swine is profound; it

Changes in animal forms brought about by man.

The pigeon.

is the work of man. Hundreds of years ago the rock pigeon, a form still common over a large portion of the world, was tamed by man. He has experimented and amused himself in seeing what could be produced. Darwin has traced the story in a masterly way. If one wishes to see what man can do he should visit the pigeon-show, remembering as he looks at lovely fan-tails, pouters, trumpeters, that they are not forms which nature has produced but that all have been made by man from the rock pigeon.

In jungles in Southeastern Asia still lives a bird—*Gallus bankiva.* It is a slender bird, long-legged, with slender head, long beak, simple erect comb, and with a tail standing almost squarely in the air. Yet from this bird man, by careful breeding, has produced all our fowls; the *cochin*, of large size and scarcely able to fly, with soft and downy plumage, thick upon the legs, with well-developed comb and wattle; the *dorking*, of large size, with great comb and wattle, and with an extra toe; the *Spanish*, tall and stately; the *Hamburg*, with flat comb and moderate sized wattle; the *Polish*, with a great crest of feathers, almost no comb, and the wattle sometimes even replaced by a tuft of feathers; the *bantam*, little but bold; the *silk fowl*, small, with very silky feathers; such, as Marshall describes them, are a few of the varied forms which man has made.

Uses of domestic animals.

If time allowed, it would be profitable to notice the different ways in which these tamed animals and birds are useful to mankind. Of course, the primary purpose in their domestication is the need for food; meat, eggs, and milk—these are the products which first made it worth man's time to domesticate animal forms. A second service is the furnishing of material for clothing—leather, fur, wool, feathers. Then horn and bone were gained as side products. One of the wonderful things in civilization is the way in which nothing is wasted; the savage

and barbarian waste all they cannot eat or turn to instant use, but in this present day, in civilization, at the stockyards every shred and atom almost of the creature killed is turned to use. Then the domestic animal serves as burden-bearer, and we see the dog, the ass, the horse, laden with packs. Akin to this is draft—dogs, horses, cattle, and other beasts are hitched to sleds and wagons. They furnish power in machinery and run treadmills. Very curious and interesting is the way in which the creature tamed is trained to use in hunting. The captive elephant aids, with almost human fiendishness, in capturing his fellows. The *cheetah,* or hunting leopard, and the ferret, the dog and falcon, are used as hunting helpers; the Chinaman, marvel of ingenuity, has turned the birds to use in fishing, and cormorants are constantly thus employed.

Has domestication reached its limit?

There is a curious difference among animals in the readiness with which they become tamed; the horse was domesticated in antiquity but the zebra has resisted all attempts to subjugate him. It is a question, sometimes asked, whether there do not lie before us, in the future, as great victories in this direction as in the past. Probably there do not; the animals which lend themselves readily to taming are probably most of them domesticated. De Mortillet quotes Isidore Geoffrey Saint-Hilaire as follows: "To the number of food animals formerly cared for in our barns and barnyards *not a single one has been added within three centuries.* Draw up a list of useful domestic species which we have to-day and you will recognize that Gessner and Belon (1550–1599) would have been able in their time to have drawn up the same list *without one single name less.*"

CHAPTER X.

THE MAN OF THE STONE AGE.

Meaning of the term, "the Stone Age."

THE term "Stone Age" is at present familiar to most readers but, unfortunately, is often misunderstood. There never has been a time, nor a condition of life, when man used nothing but stone for tools and weapons. At all times he has had at his disposal, and very early must have known how to use, other materials, such as bone, horn, shell, ivory, and wood. It is true, however, that there has been among most people a period when they have not known the use of metals; or, if they have known metals at all, it has not been a knowledge which involved the smelting of metals from ores. To this period among any people the name of "Stone Age" has been given. During this stage man has commonly made his implements, tools, and weapons largely of stone. The Stone Age, then, is not a period of time which is past, once for all, the world over. It is true that in Western Europe the Stone Age ended many hundreds of years ago; but in the Pacific Islands the Stone Age was in progress when white men first reached there; in North America the Stone Age continued among the Indians until the last century; in South America there are, no doubt, many tribes who still live in their Age of Stone. The term, then, should be used to designate a stage of culture, not a period of time.

Terms "Palæolithic" and "Neolithic."

The Stone Age in Western Europe has been, and probably rightly, divided into two portions, called the Palæolithic and the Neolithic periods. During the Palæolithic, man made his

FIG. 12.—HOOK OF WOOD, WITH IRON PRONG, USED IN CATCHING HALIBUT. Alaska. The carving on the upper arm represents the suckers of a cuttlefish.

tools of stone, rudely, by chipping; in the Neolithic, he still made chipped tools, frequently of great beauty and delicacy, but in addition he often polished his stone blades. By derivation the words mean the older and the newer Stone Age. The terms are convenient and may well be used with reference to European prehistorics; but because they are convenient terms in discussing the facts of that district is no reason why we should insist upon their universal application and their use in every region. If facts show such subdivision in America or elsewhere, well and good; but there has been some tendency to translate facts into these terms carelessly.

Generalized character of primitive tools.

So much as to preliminary, dry definition. Let us now consider what the primitive tools of man were like, how they were made, and how they acted on their users. Primitive tools are generalized. Perhaps the oldest implement of man we know is the flint *haché* from the glacial gravels of France and other parts of Western Europe. It is a coarse, heavy, rude implement, chipped to shape by great spalls being broken from its surface. It is somewhat almond-shaped; may average about a hand's length; is thick and heavy. It is probable that this object was used for many purposes. It would be a weapon grasped in the hand and used in close combat; it would be a hatchet for breaking open bones to get at the marrow; it would be a knife for forcing open shells of mollusks; it might be an ice-pick for cutting holes through ice in winter in order to get at fish. Tylor mentions that the spear-point of iron which the African has made for himself may be used by him as a knife for smoothing the spear-shaft itself. The stick which the primitive man picked up in the woods he would use for every purpose. Hurled at a passing bird, it was a missile; held in the hand and wielded for defense, it was a war-club; used for thrusting, it became a spear; as a digger of roots it was, perhaps, the first agricultural implement; to the man astride a floating log upon

E.g., the *haché*.

The African spear-point.

The stick.

the river, the same stick became a help in handling the primitive craft.

Such generalized tools become specialized.

Ere long the implement that had been so generally used gradually differentiated into several tools, each for its own purpose. The simple stick becomes pointed at one end and thereby a better spear; broadened at the end, a better paddle; carved or knotted at the end, a better war-club. This history of specialization might be traced in regard to all tools and instruments. Tylor calls attention to the fact that the stone spear-head is the father of all two-edged swords; the flint spear-head lengthened and delicately chipped becomes the dagger; the stone dagger, copied in bronze by ancient man in Europe, grows longer, and at last becomes lengthened to such an extent that it is not a dagger but a true sword. The same author traces a conceivable development of the celt or smooth-polished stone axe-blade, through the bronze war hatchet, into single-edged knives, such as sickles and bill-hooks. Although his demonstration in the latter case is not as satisfactory as in the former, the idea is suggestive and interesting.

Primitive methods of working stone.

(*a*) Chipping:

How did the man of the Stone Age make his stone tools? There are some three chief methods of working stone which he devised: (*a*) chipping, (*b*) polishing, (*c*) drilling. Evans, in his "Stone Implements of Great Britain and Ireland," gives many interesting details in regard to the working of stone tools, and other writers, both before and since, have spoken with more or less fulness in the matter. In order that the stone shall chip well, it is necessary that it should be fine grained, compact, brittle, and with conchoidal fracture. There are two ways in which the piece of stone may be considered. The idea may be to secure from it flakes, which afterwards shall be chipped to form, while the nucleus or core left after the chips have been removed is thrown away. Or the intention may be to work the core itself directly into shape, the flakes split off being a matter

of little or no consequence. Three methods of operating in the chipping of stone have been followed. Sometimes heat is used as a help, and travelers have described how Indians, in our western country, have worked their flint into arrow-heads by means of hot stones, which were applied to the material at points where the flakes were to be lifted, and the heat combined with pressure removed flake after flake until at last the desired point was made. By heat;

A common mode of chipping stone was by percussion—free blows with the hammer-stone held in the hand. It is likely that much of the coarser work in chipping stone implements was done in this way. Much depended on the skill of the workman, and many implements would certainly be broken. Perhaps as crude a way as any in which stone blades were made by percussion is that described among the North Australians by Baines: "The native having chosen a pebble of agate, flint, or other suitable stone, perhaps as large as an ostrich egg, sits down before a large block, on which he strikes it so as to detach from the end a piece leaving a flattened base for his subsequent operations. Then holding the pebble with its base downward, he again strikes so as to split off a piece, as thin and broad as possible, tapering upward in an oval or leaf-like form, and thin and sharp at the edges. His next object is to strike off a piece nearly similar, so close as to leave a projecting angle on the stone, as sharp, straight, and perpendicular as possible. Then again, taking the pebble in his hands, he aims the decisive blow, which, if he is successful, splits off another piece with the angle running straight up its center as a midrib and the two edges sharp, clean, and equal, spreading slightly from the base and again narrowing till they meet the midrib in a keen and tapering point. If he has done this well he has a perfect weapon, but at least three chips must have been formed in making it, and it seemed highly probable from the number of im- By percussion;

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perfect heads that lay about that the failures far outnumber the successful results. In the making of tomahawks and axes, in which a darker green stone is generally used, great numbers of failures must ensue; and in these another operation seemed necessary, for we saw upon the rocks several places where they had been ground with great expenditure of labor to a smooth, round edge."

By pressure.

While chipped tools might be made by the help of heat combined with pressure, and by free blows with the hammer-stone held in the hand or in the way just mentioned, it is certain that the choicest specimens of chipped implements were not made in either of these ways. The most widely used means for delicate work in chipping stone was certainly by pressure, and of this method there are many descriptions left by travelers among various people. Thus Lubbock quotes in regard to modern Mexicans that they work obsidian by pressure. "They take the obsidian in the left hand and hold grasped in the other a small goat's horn: they set the piece of stone upon the horn, and by dexterously pressing it against the point of it while they give the horn a gentle movement from right to left and up and down, they disengage from it frequent chips, and thus obtain the desired form." In the same way the Eskimo are described by Edward Belcher as making their arrow-heads. "The Eskimo tool is made of an ivory handle, with a reindeer horn point secured in place by a strong thong of leather or sinew, which is put on wet and becomes rigid by drying. The flake is sometimes fixed by means of a cord to hold it firmly and well, the large-surfaced flake being produced either by blows direct from a hammer or through the intermediate punch of reindeer horn. The head thus roughly shaped out is finished with the flaker."

On Twelve Mile Island in the Mississippi River, near Guttenberg, Iowa, a band of Pottawattamie Indians were noticed

making arrow-heads in the following way: A deep notch with a flat bottom was cut in a tree trunk to a depth of several inches. A flat stone was laid upon its lower surface, the long bone of a deer sharpened at one end was driven into the back part of the notch. The bit of flint to be operated upon was then placed upon the stone platform; the bone was brought to bear upon that part of the flint where a flake was to be raised. The stone was shifted, and flake after flake removed until, at last, the arrow-head was completed. Torquemada has left an account of the way in which obsidian was made into razors or knives by the ancient Mexicans. A stick as large as the shaft of a lance, three cubits or more in length, was taken, at the end of which another piece of wood, eight inches long, was firmly fastened to give strength to that part; a piece of stone, eight inches or so in length and as large around as the leg, was held between the naked feet; the stick was taken in both hands and pressed heavily against the edges of the stone by the breast. Long blades, sharp on both edges, were thus rapidly dislodged. The old writer says that "twenty knives in a very short time" could be thus easily made.

(*b*) Polishing.

The second operation which primitive man devised for working stone was polishing. Many tools and weapons, such as arrow-heads, barbs, knives, saws, and the like, are not much, if any, improved by polishing; but axes, some forms of hammers, and many ornaments were always, or usually, polished. In making a stone tool such as the grooved axe, which is common in many parts of North America, the Indian would first look for a pebble as nearly the shape and size of the tool to be made as he could find. He would then, with his stone hammer or some pebble on which was a blunt point, pound the whole surface of the pebble over and over again. The design was not to break off flakes, but simply to wear away the stone until it should be more nearly the shape desired. Where there

were undesirable prominences there the blows would be often repeated. This dressing down a stone to a desired shape by repeated blows may be called *pecking*. In time—and Mr. McGuire (who has made some interesting experiments in the direction of working stone tools in primitive ways) says no very great time is needed—the pebble was brought into the shape and down to the size desired. It still remained to polish it. This was done by rubbing the pecked tool back and forth upon a grit or sandstone; sand itself was sometimes used, no doubt, in this process. The whole surface of the tool was frequently polished, uniformly and beautifully, and the edge rendered very sharp. It is not at all uncommon, on old village sites, to find great bowlders which have been used for grinding axes and other tools upon, in this way. Such frequently have grooves worn in them where the polishing had been carried on; where the sides of the tools were polished the grooves are broad and deep; narrow grooves show where the edges have been worked out. It is wonderful to what a degree of perfection the man of the Stone Age could bring his tools; some adzes from the South Sea Islands and axes and hatchets of flint from Western Europe and certain ornaments made by native Americans can hardly be surpassed.

Pecking.

A third important method of working stone devised by primitive man is drilling. It is no uncommon thing in Europe to find stone hammers or axes with holes drilled through them, and it is common in this country to find stone ornaments drilled for purposes of suspension by means of cords. A series of such drilled stone specimens usually indicates two ways in which drilling was done. In some cases a solid drill was used, producing a hole which is much larger at the upper end and diminishes downward; very commonly such holes are bored from both sides and meet in the middle part of the stone. It is probable that as good a drill as any for drilling

(*c*) Drilling:

By a solid drill;

stones in this way was a stick of wood, which was used with sand, and which, by repeated turning, wore the hole. Very common in archæological collections are certain long and narrow points of flint which are usually called drills. It is possible, of course, that they may have been at times used as drills or borers, but they seldom show signs of such use. A soft material in which the grains of sand would bed themselves would be much better. The other type of drilling produces a hole which has about the same bore from one end to the other. Such holes were usually bored with hollow drills. A bit of elder branch or a reed, such as grows abundantly in our Southern States, could be, and no doubt often was, used in drilling such holes. The commonest type of American stone objects drilled in this way are what are known as banner-stones. A good many specimens of banner-stones have been found in which the drilling had not yet been fully carried through; in these cases it is plainly to be seen that a hollow drill was used, as the core left by the drill still remains in place.

By a hollow drill.

Among the most noteworthy specimens of drilling in hard stones by rude men are the very curious cylindrical pieces of quartz which are worn by certain South American Indians. These are pierced transversely by a slender hole, which is said to be produced by repeatedly turning the tip of a leaf which ends in a long and slender spine.

We have noticed the different ways in which the man of the Stone Age worked stone and how he made his stone tools and weapons. While he was making his discoveries in lapidary work he was at the same time making progress as a worker in many other materials. There was a parallel development going on in working wood, horn, bone, and shell. More than this, the necessity of fastening the stone blades to wooden shafts and handles drove man to discover the use of resins, pitch, etc., and to invent cords and twisted fastenings.

Parallel development in working in other materials.

Quality of tools of stone.

Nor need we think that stone tools were poor tools. The old wooden rattles of the Tlingits carved with stone knives are sometimes as fine in workmanship, as neat and handsome, as anything produced at present with white man's tools. The Ahts long preferred their mussel-shell adzes to the best English chisels in making their canoes. The Northwest tribes without the aid of fire cut down great cedars for their "dug-outs" with their stone tools; then with chisels of horn and stone mallets they work them into shape. The Polynesians made good boards. A log was set near the fire with its end near the blaze. It cracked with the heat; wedges were driven into the cracks, and the logs separated into long narrow segments which were afterwards shaped with stone adzes into true boards. In constructing houses or canoes these boards might be joined together by pegs, dovetailings, or cords. Some of the canoes made by the South Sea Island peoples in their Stone Age were a hundred feet long, with bottoms made of a single plank, the sides closely fitted, and the joints neatly closed with gum from the bread-fruit tree.

Influence of the stone tool upon man in society:

(*a*) In causing compacts between tribes;

The man made his stone tool, but in turn the stone tool reacted upon its maker and made him. The stone tool had an important influence upon society. Some of its results deserve mention. First: it was, perhaps, the necessity for material for making stone tools that led to the first compacts or treaties of peace between tribes. It is well known that the savage man is secure so long as he remains within the territory of his own tribe; the moment that he passes into the territory of a foreign tribe his life often pays the forfeit. There are, however, some exceptions to this rule. Thus, Lippert states that in some parts of Australia there are quarries yielding material much prized for making axes; it seems that these quarries are not considered the property of the tribe on whose land they lie, but they are open to people of all tribes who choose to come and take the

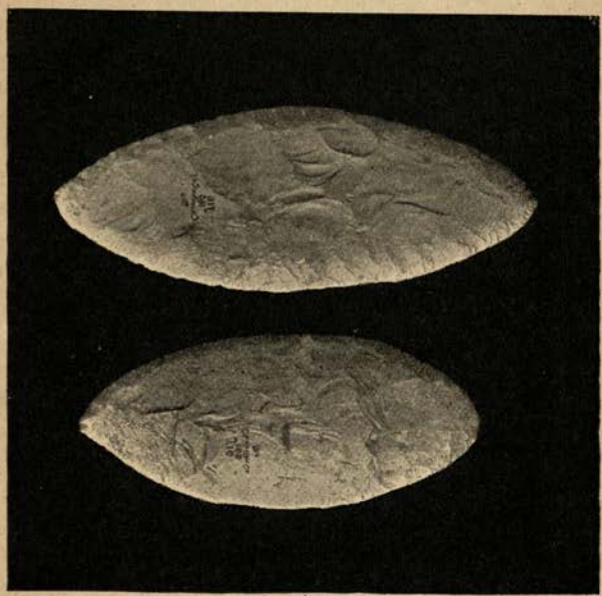

FIG. 13.—CHIPPED STONE BLADES. Missouri.

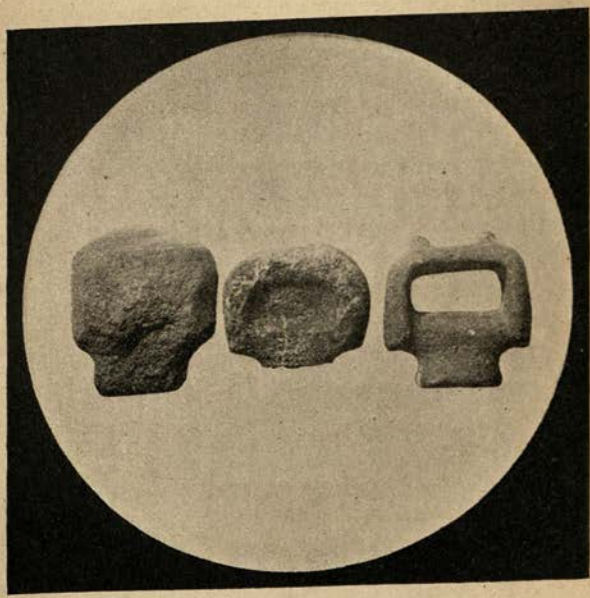

FIG. 14.—BERRY-POUNDER OF STONE. Alaska.
To show stages of manufacture.

material; accordingly, parties which are bent on such an errand are allowed to pass unharmed through hostile territory. Something analogous was true regarding the famous red pipe-stone quarry in Minnesota; when white men first visited this locality they found marked on the rock-cliffs in the district the totems or emblems of chiefs of many tribes. It is probable that parties going to the famous quarries for catlinite were allowed to pass unharmed.

(*b*) In producing inter-tribal trade;

Again, the stone tool and the necessity for it led to trade and tribal exchange—in other words, to the first steps in commerce. It was not always possible for parties to visit distant localities to secure material, but the material itself was passed from hand to hand, from tribe to tribe, over large areas. In a single mound in Ohio, Professor Putnam found objects of copper, obsidian, sea-shell, and mica. The copper, no doubt, came from Lake Superior, although it might have been picked up on the surface nearer; the obsidian probably came either from the Yellowstone district or from Mexico; the shell was of a kind native to the Gulf of Mexico; the mica certainly came from old quarries, signs of which still exist, in North Carolina. It is evident that the raw materials were passed in trade from hand to hand over wide districts in this case. Dr. Mearns found several large pieces of catlinite in cliff-dwellings in Arizona; this material is believed to have come from Minnesota. The beautiful honey-yellow, fine-grained, easily-worked flint of Grand Pressigny, France, was carried over the whole of Western and Central Europe, and knives, saws, spear-points, and arrow-heads of it are to be found on many sites.

(*c*) In leading to division of labor.

The stone tool led to division of labor. We have already claimed that the discovery of fire led to a division of labor, but that was between the sexes; the woman stayed at home to attend the flame while the man went afield to secure food. But, as between man and man, the stone tool certainly led to per-

haps the earliest division of labor. One man would make better tools, more easily and rapidly, with greater taste and skill, than would another; the latter, in his turn, might be a better hunter. We may be sure that the former could stay at home making stone arrow-heads, while the latter would provide him with his game in exchange for the products of his skilled labor. Certain men among peoples of the Stone Age might become almost real trades-folk, and there may have been professional axe and arrow-head makers, ornament polishers, and the like.

CHAPTER XI.

THE MAN OF THE STONE AGE (*Continued*).

After the Stone Age man attaches superstitious ideas to the stone tool.

BEFORE we pass entirely away from the stone tools of primitive man, we may notice two very interesting facts in man's mental make-up. He sanctifies all that is old and he keeps up as survivals practices once in use. It is very curious, but true, that over a very large portion of the world the stone tool is looked upon with superstition, with reverence, or with awe. The matter has been fully described by many writers and we shall, therefore, content ourselves with giving but a few examples.

The stone axe.

Throughout most of Western Europe the stone axes of the olden times, which are picked up occasionally upon the fields or dug up in the course of excavations, are believed to be thunderbolts which have fallen from the sky. They are also very commonly believed to protect the person who owns or carries them from lightning. Thus in Germany we find peasants calling the stone "donner keile"—thunder chisels; they are kept in families as a protection from lightning; they perspire when a storm approaches; they are found only nine days after falling; a common saying regarding the stone axe is, "He who chastely beareth this shall not be struck by lightning, nor the house, nor the town where this stone is." So also, in Russia, when a peasant finds a stone axe or a "thunder-bolt" he preserves it as protection. If he builds a new hut, the stone axe is built into the house, under the threshold, and is a sure protection against the tempest. If, however, his house is already built, the stone is carefully guarded, and when the winds

and clouds and muttering thunder predict a storm it is brought out and placed upon the table. With it are also placed a candle blessed by a priest of the village and a holy crucifix, and surely with this triple guarding, combining charms of the ancient and the modern time and objects connected with both paganism and Christianity, no danger should be apprehended. But the value of the old stone axe is not confined to its ability to protect against storm. In Cornwall, water in which the celt is boiled is a cure for rheumatism ; in Brittany, it is put in wells to purify the water and to keep up its supply ; in Germany, it is good for diseases of man and beast ; it increases the milk of cows, assists in birth of children, and becomes most valuable as a remedy for children's diseases ; in Saxony, rolled in the wool of sheep or the hair of goats it brings good luck to the flock or herd, and prevents rot and putrid decay. These are but a few of its mysterious powers.

The arrow-head.

The stone axe is not the only relic from the olden time that has magic power ; arrow-heads, also, now (and even anciently) are recognized as charms ; in Scotland, Ireland, and other countries they are called "elf darts," and are believed to be weapons of the fairies. The superstition is sometimes held that they are never found by looking for them. They are often mounted in silver and worn as charms against the attacks of elfs or fairies. Sick cattle are often thought to be elf shot. When a peasant believes that the disease which ails his cattle is due to such a cause he calls a fairy doctor, who with much mystery proceeds to suck the part which he states is the seat of the disease, drawing out thus the fairy darts themselves ; then he places them with coin into water from which the animal drinks and is cured. In Southern Europe, also, we find curious notions regarding the stone arrow-head. A countryman when finding one—he calls it a tongue of St. Paul—devoutly kneels before it, picks it up with his own tongue, and keeps it for a charm ;

in Northern Africa Arabs wear necklaces of carnelian beads, which are imitations of old arrow-heads, "because they are good for the blood."

Spindle-whorls.

So, too, the curious little spindle-whorls which in the olden time were used as disk-shaped weights upon the wooden spindle are looked upon with superstition. They are called "fairy grinding stones" and "fairy mill-stones."

Explanation of such superstitions.

How shall we explain such a thing as this? It seems as if we find such ideas beginning in districts where the Stone Age is to-day only just passing away. Not long ago, when white people first visited Alaska, the Indians were in their full Stone Age. They had stone axes, mauls, adzes, knives, chisels, and the like. To-day they are learning more and more to use the white man's tools, and year by year the old Stone Age implements become rarer and rarer. In many a house they lie neglected. Now and then, however, when a man wishes to undertake some enterprise of more than usual importance he takes down the old stone adze to use it in the day's work. It is the natural attribution of power and luck to the tool with which we are familiar, or which has brought success to parent and grandparent before us; it is respect for the tried and tested thing of old. Curiously, that the full benefit of taking the old tool may be secured, the wife at home is forbidden to speak a word during her husband's absence for fear of spoiling the charm. Among these Alaskan people it is perfectly well known that this stone adze was once in common use; it is known how it was made and for what. But we see that even with this knowledge present the tendency grows to look with reverence on the tool, simply because it is old and has been tried. In a little time the fact that the tool was once in common use will drop from sight, but by that time the value of the stone tool as a charm will have been fully settled. Still later, when the tools are no longer to be found in every house, but when ex-

ceedingly old ones are to be picked up here and there, the idea that they are charm stones will be the only one connected with them. The future Alaskan may not know that his ancestors made and used these objects; but as they have magical power they will be attributed to supernatural sources.

"Survival" of the stone tool.

The other interesting fact to which we have referred is the survival of practices once in use. The old stone tool dies hard. As the new and better implement comes into use there are certain persons who, true conservatives, persist in keeping up the use of the older types. Of course, the religious officer will use the stone tools long after the laity have put them aside. Thus, among the Jews stone knives were long used in circumcision; the Septuagint distinctly states that the stone knives which Joshua used for circumcision of the Jews were buried with him in his grave. Even to the present, at times, among some modern Jews, a fragment of flint or glass is used instead of a metal knife. One may justly infer that the Jews were in their Stone Age when they first began to perform the rite of circumcision. When metal was introduced among them, knives of the new material came into use for ordinary purposes, but the old stone tool continued long in use in the religious ceremony.

Among the Egyptians the *paraschites* used a knife of stone in cutting open the body which was to be embalmed. Thus Herodotus and Diodorus Siculus state: "The body being laid on the ground, he who is called a scribe first marks on its left side how far the incision is to be made, then the *paraschites* having an Ethiopian stone and cutting the flesh as far as the law allows, instantly runs off, the bystanders pursuing him and cursing him and pelting him with stones and, as it were, turning the horror of the deed upon him." Does not this practice suggest that when the Egyptians first embalmed the dead they were in their Stone Age? Of all the punishments inflicted by

the Jews on criminals the one which above all others was religious punishment was stoning. Is it not possible that this, too, was an extremely ancient practice; that men among the Jews were stoned to death for crimes because they had no other mode of conveniently killing criminals? If so, the custom became fixed and would be preserved as a religious punishment or as a punishment for crime against religious law long after it had disappeared in other cases. A last example of such survival of Stone Age tools in religious custom may be mentioned, the covenant of blood among the old Arabians. A man stood between the parties, and with a sharp stone made cuts on the inside of their hands, and with the blood smeared seven stones, calling at the same time upon the gods.

CHAPTER XII.

METAL-WORKING.

How metals came to be known.

IN HIS experiments at making stone objects and in his search for materials for such, man must early have found certain stones that differed from others in being hard, very heavy, and in some cases possessing brilliant colors and fine lusters. Such stones on account of their beauty would be sure to come into use for ornaments. The first metals man learned to know were such as occurred naturally in a pure condition, as copper, gold, silver. Such pure metals naturally occurring are called native metals; the mixture of metallic substances with other elements and with stony matter is called ore. The native metal being pure can be used just as found; the ore must be smelted by the aid of fire, and usually with some other substance, to withdraw the impurities with which it is mixed. Almost all native metals are soft, malleable, bright colored, shining. The commonest of all, of course, is copper, and there are portions of the world where great quantities of native copper are found; the best known, perhaps, is the Lake Superior region. Such copper attracts attention from its bright color, and may be pounded with stones into any shape. Not utility but beauty led to its being taken and worked. It is a significant fact that far more ornaments of copper have been found in this country than weapons or tools. In the same way, in the Lake-Dwellings of Switzerland there are far more objects of ornament than of utility found in bronze.

Native metals first.

We may see the most primitive use of metals in North

America. In mounds, Professor Putnam has found ear ornaments of curious spool-shaped form made of native copper, of native silver, and of native iron. The copper and the silver came from Lake Superior; the silver, in spots and blotches, occurs scattered through the copper. The native iron probably was meteoric, falling, a melted mass, from the sky. All three of these materials are soft, malleable, and, when fresh at least, have brilliant luster. Little ornaments of native gold have also been found in mounds. Very remarkable is the find by Mr. Moorehead in an Ohio mound; it consists of very many thin plates of copper which had been cut to shape and bore upon their surface carved designs. The most interesting copper objects from American mounds came from Georgia. They are thin plates of considerable size, upon which are carved, with no mean skill, curious human figures, winged and strangely dressed.

Use of copper in North America.

It has usually been believed that the natives of North America did not use fire to any great extent in working copper; that they simply beat the cold metal into shape with stone tools. Consequently, when these even, well-made plates were found in Georgia and the curious little pieces cut from thin, uniform metal plates were found by Mr. Moorehead, some believed that they show, not simple Indian work, but the influence of white people; if the objects were not made entirely by Europeans—so it was urged—the plates at least were brought by them. Mr. Cushing, in a most interesting paper on primitive copper work, claims that these objects were really made by Indians; that the native Americans were perfectly competent with nothing save stone tools to make uniform plates of metal of considerable size. To demonstrate his belief he conducted an elaborate series of experiments in working native copper with the aid of stone tools and has probably reproduced the ancient mode of operation. Mr. Cushing has had the advantage of seeing Indian tribes in our southwestern country at metal work to-day;

How it was worked.

Mr. Cushing's experiments.

he has seen them not only working metals but also knows their modes of dealing with other materials, such as skin and horn.

Speaking of metal-working in the Southwest Cushing says: "I have found evidence that ore rich in scales or seams of copper, too minute to be useful in native state, was there quarried, and first roasted in an open fire, then baked, so to say, or partially smelted in a kind of subterranean funnel-shaped oven-furnace or kiln, terminating at the base in a round, nearly flat-bottomed pot, or relatively small pocket. Smelting in this kind of furnace or kiln was accomplished by introducing only a small quantity of the ore at a time, surrounding and covering it with fuel; firing and replenishing the latter until fusion resulted. On cooling, the mass of cinders, slag, etc., was raked out, and the copper or other metal culled from the pocket at the bottom of the kiln, where it occurred in buttons or irregular nodules. . . . . In order to test my archæological observations and some vague Zuñi traditions regarding this method of reducing ore, I once gathered, while traveling through a portion of the Zuñi Mountains, several stones showing traces of clear copper. Making a large fire in a hollow, I cast the rocks into the middle of it, gradually increasing the fire until the stones were aglow with heat, and, keeping it up for some hours, allowed it to die down. Afterwards, on raking the embers and ashes away, I discovered several small buttons of copper. The primitive Pueblos worked nodules of copper thus obtained by alternate hammering and annealing."

Cushing further calls attention to the words used by Zuñians for metals. *He-we* is the general term for metal. It is derived from *he-sho*, which means wax, pitch, or resinous gum, and *a-we*, stones, and means, hence, fusible stones. If our author is correct in his etymology it is plain that the idea of melting metals must have occurred to the ancestors of the Zuñi Indians as early as the knowledge of metals themselves.

Cushing then proceeds to describe his experiments. He says: "When these people dress a piece of rawhide, they lay it upon a very smooth, flat, but rounded bowlder and rub-hammer or hammer it slantingly from the center outward, thence from the peripheries inward, but always by oblique strokes tending outward. Now, I find that a piece of copper or other soft metal thus treated rapidly spreads, behaving somewhat as a rawhide does. When a maul with a slight but very firm grain is used, the rough face aids the thinning and spreading of the metal by displacing the surface molecules at a multitude of minute points; thus pitting the face of the metal and keeping it from becoming harder and more brittle than the mass or medial portion; thereby also the metal is toughened, is not so rapidly hardened throughout, and is actually not so liable to scale or crack as when treated with a smooth-faced hammer of iron or steel. As soon as I have, in this manner, reduced a plate almost to the desired thinness, I have with a smoother stone, supplied with a flexible handle, gone over both sides of it to reduce all the larger irregularities and to partially smooth the surface where pitted by the coarser maul. This may be done partly by hammering, partly by combined rubbing, pressure, and rolling with a smooth unmounted bowlder. I have then proceeded precisely as an Indian would in dressing down the flesh side of his hammered sheet of *parfleche*. I have taken flat-faced pieces of fine sandstone and, laying the sheet of metal on a firm, level spot with a buckskin underneath to act as a buffer and also to help hold the plate in place, have ground, then scoured, first one face, then the other, until uniformity of surface and thickness has been secured."

In this way the thin plate of metal was produced. Cushing then proceeds to describe his mode of engraving it. He says: "I first prepared my plate of metal as above related and softened it by heating to redness for several minutes on the

brisk ember-fire. When cooled I lightly traced the outline of the figure on one face of the metal plate, and placed the latter, with tracing uppermost, on a yielding mat of buckskin, folded and laid on a level, hard spot of ground. Then I took a long, pointed tool of buckhorn and, adjusting the butt of it against my chest and the point to the design, pressed downward with as much of my weight as was needful to make it sink slightly into the metal, and, continuing the pressure evenly, went over all the longer lines of the tracing with it. Moderately deep and remarkably sharp, smooth grooves were thus plowed or impressed in the ductile metal wherever the horn point had traversed it, except along upward curves and around sharp turns, or where hard places happened to occur in the plate. In order to deepen the grooving at such points as these, I found that it was only necessary to use a pointed chisel made from the humerus of a deer, like an Indian skin-flesher of bone. This, firmly grasped and pressed by the hand alone, then rolled or rocked to and fro, served admirably to deepen straight curves to any extent desirable, or, if twirled while it was being pressed down and rocked, to impress or deepen curved lines. When all the lines of the design had been completed by these combined processes of pressure-drawing with the horn tool and pressure-rocking with the bone tool, the plate, on being turned over, exhibited in clearly raised outline the reverse of the pattern I had traced and thus embossed. On grinding these sharp edges crosswise with a flat piece of sandstone their apices were speedily cut through, and the form as outlined by the embossing was thus completely severed from the plate, leaving the portions from which it had been removed like the open spaces of a stencil."

Summary on American copper-working.

It is likely that Cushing is right. The old Indian workers of copper, on our continent, apparently took the metal, heated it, worked it while hot with their stone tools, reheating it when

necessary. From the sheets thus beaten out they cut their ornamental forms. Still thinner sheets were used for covering various objects of wood or stone, bone or shell. Solid masses of the precious, bright stone were beaten, with the help of heat, into arrow-heads, spear-heads, knives, hatchets, and into beads of various forms. With such tools of horn and bone as Cushing used they could draw ornamental patterns. Finally they polished irregular surfaces smooth with pieces of flat stone.

Ancient mines in Lake Superior district.

Not only do we find, in mounds and elsewhere, these old copper objects made by the mound-building tribes of Indians, but we also find evidences of their mining operations in the Lake Superior district. Parties, perhaps, went from the South to Lake Superior for mining purposes. There were plenty of veins for them to work; hundreds of their old openings have been discovered. In one pit was found a rude old ladder made by trimming branches from a tree so as to leave footholds. Preserved by water, in which they were lying at the bottom of old mines, were wooden levers, wooden shovels, wooden bowls, and troughs for bailing. There were great quantities of ashes and charcoal also. Thousands of rough stone mauls and hammers, grooved for the attachment of handles, have been found; from a single mine more than two cartloads were taken. Some of them are so heavy as to require two men in their use; such have two grooves for attaching handles. One maul still had a trace of the handle fastened to it. In one mine was a great mass of pure copper worked out and raised on a rude cobwork of rounded timbers six to eight inches in diameter. Numbers of rude copper wedges were also found in these old works. From these relics we are able to reconstruct a picture of the methods of those old miners. They first loosened the soil and scraped it away with wooden shovels; then the rock was heated by building fires upon it, after which water was dashed over it; great masses were thus broken off. The

loosened rock was then broken up with heavy mauls, so as to separate the masses of pure copper which were scraped together and scooped away with shovels. The water which ever gathers at the bottoms of such excavations was bailed out with wooden troughs. Levers and cobwork were used in raising great masses of the metal which were loosened, when necessary, from the vein of which they formed a part, by means of wedges driven with mauls.

Succession in Europe.

Such, no doubt, were the first steps in metal-working the world over. In Europe archæologists usually consider the Age of Bronze as following closely upon the Age of Stone. It is probable that in some parts of Europe, at least, the use of copper, in the way we describe, preceded the knowledge of bronze; there certainly was an Age of Copper in Hungary, and Gross believes he finds evidences of such a time among the Swiss Lake-Dwellers. For most of Western Europe, however, the evidence for such a condition is not clear.

The Bronze Age.

Bronze, a mixture of nine parts copper to one part tin, was used in many districts. It seems probable that the knowledge of this useful compound was introduced from the East. Of course, the making of bronze must have first been discovered in a district where both copper and tin are found in the rocks. Once discovered, it is not strange that its use gradually drove stone tools and weapons out of service. Relics of bronze have been found in Great Britain and Ireland and in France, Germany, Denmark, Sweden, Italy, Switzerland, Spain, and Portugal. The tools, weapons, and ornaments made in different sections have somewhat characteristic peculiarities. Nowhere was the use more fully developed than in Denmark; nowhere were there more beautiful forms than in Scandinavia. Here we find, as elsewhere, that metal in its early use was very largely for purposes of ornament; most elaborate and curious forms of fibulæ—ornamental pins, constructed on the principle of the safety pin; buttons; rings for

fingers, wrists, arms, ankles, legs, and neck, often of strange and complicated types; great pins for fastening garments or for decorative uses; curious disks, with patterns in great variety carved upon them, for attachment to the clothing—such were a few of the many ornaments made by the old Danes from this new and precious material. They also made tools, such as pincers and razors, knives, frequently of curved forms and with the blades engraved, chisels, and the like. Weapons, too, occur—arrow-heads, spear-heads, lance-heads, daggers, swords, imitating, of course, in shape the old, old patterns which had been made so long in stone. In some old peat-bogs have been found gigantic trumpets made of bronze, gracefully coiled, used apparently in pairs by trumpeters. More than two thousand years have passed since they were made for use, and they are so good in workmanship that in these latter days they have been made again to breathe forth martial music; we ourselves have heard their tones.

It has often seemed surprising that the use and knowledge of a compound such as bronze should precede the knowledge of a simple metal such as iron. Such, however, appears to be the case in Europe, and its simplest explanation would seem to be that the knowledge originated elsewhere and was brought to the European continent. The Bronze Age for Denmark ended early in our era and iron has been known there for nearly two thousand years. The bronze was worked by melting and casting in molds. These were usually made of sandstone and many specimens of them may be seen in European museums.

Order of events in Africa.

It is a great mistake to think that the same succession of events must naturally repeat itself in all districts. In Western Europe we have the series—Stone Age, Bronze Age, Iron Age; we have suggested that in Hungary a Copper Age should be inserted before the Bronze Age. In Africa—that is, negro Africa—we find no evidence of a Bronze Age or of a Copper

Age, but man passed at once from using stone for tools and weapons to working iron. The negro is a true metallurgist. Over a large portion of his territory a very easily worked iron is abundant. The methods he pursues in treating it are the simplest. The form of furnace varies much from tribe to tribe. Among the Bongos, it is composed of clay, stands five feet in height, and is divided into three compartments, one above the other; in the upper and the lower only charcoal is placed; in the middle section are alternate layers of ore and fuel. A sort of grating, supported by a circular projection, separates the lower from the middle compartment; a narrow passage connects the middle with the upper. Four holes at the bottom of the furnace permit air to be blown in by means of bellows and allow also for the drawing out of melted slag; through a fifth aperture, which is kept plugged with clay, the molten metal is drawn off. For bellows they use two cup-shaped bowls of clay or wood, covered at top with bladder or with skin tied closely about the edge. A stick is fastened to the middle of each of the bladders, on its upper surface; in the side of each is an aperture for the escape of air, and into these are thrust little spouts of wood, which open into a single funnel of clay. One man takes the ends of the sticks, which are fastened to the bladder covers, one in each hand, and then alternately raises and lowers them. By so doing he drives a steady current of air through the clay funnel into the fire. Besides his furnace and his primitive pair of bellows the African smith has a round pebble for a hammer, small chisels, and a pair of tongs made of a green stick of wood. With such an outfit he makes articles that will bear comparison with those made by English workmen. Razors, two-edged knives, spades, heads for arrows, lances, spears, throwing-knives—such are his products. The heads of African spears are frequently real works of art. They may be long and slender, broad, almost round; they may

The negro smith at work.

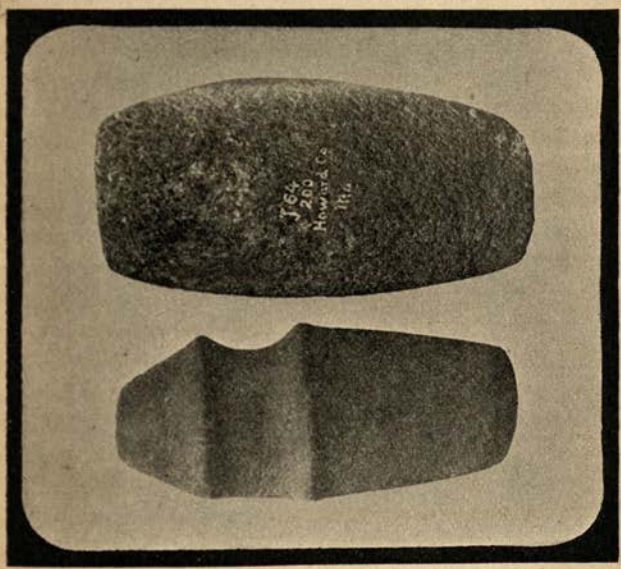

FIG. 15.—GROOVED AXE OF STONE.
To show stages of manufacture.

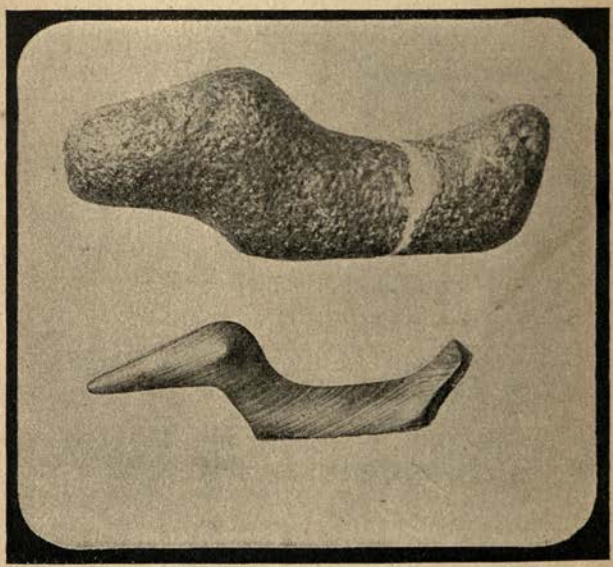

FIG. 16.—BIRD AMULET OF STRIPED SLATE.
To show stages of manufacture.

have smooth and simple edges, or may be barbed with cruel long projections, or notched along the sides with sawtooth points. Mrs. French-Sheldon tells of the delight and satisfaction which the workers take in turning out a perfect and beautifully finished point. She has seen them take as patterns some beautifully symmetrical, smooth, perfect-outlined leaf, and, in the shaping of their weapon, compare it with the pattern, holding both before the eye, one in front of the other, until their outlines exactly coincide.

The final step in metallurgy.

A factory of steel presents the very culmination of man's ingenuity in metal processes so far achieved. To-day in civilization the crude ore mixed with the fuel and limestone flux is turned into a great blast furnace and after a few minutes drawn out as molten stuff into the molds. Almost before it cools, the pig-iron is carried into the steel works, mixed with its proper proportions of other substances, melted again, poured out into great crucibles and ladled into ingot molds of giant size. These loaded on trucks are carried to a reheating furnace; handled by machinery—great iron fingers that work as skilfully and carefully as if connected with the thinking mind of some giant—they are placed between revolving platforms; caught from them by jaws that crush and press them they are driven back and forth, from one into another, until at last they come forth great rods of steel. These in turn are caught by other wonderful mechanisms, cut to size and twisted, rolled, pressed until the shape desired. An hour more than suffices to take the raw, crude pigs of iron and turn them into rails for tracking or into wire for binding. It is the last chapter; the first is the savage pounding his hot copper with the rude stone hammer.

CHAPTER XIII.

WEAPONS.

Man's first weapons.

THE first weapons which man used were simply the stick and the stone, which he picked up when need impelled. These two crude weapons have undergone a vast series of changes, fitting them more and more perfectly for definite results.

The stick.

The stick may be used in two ways—either to strike heavy blows or for thrusting.

The club.

Used in the former way we have in it the germ of every kind of battle-axe and war-club, while used in the latter way we have in embryo all kinds of spears and darts and two-edged swords. A stick heavier at one end, knotted and gnarled, made a superior weapon for cracking skulls. Such clubs have been developed marvelously among some peoples. A short club of this kind is not well adapted for use while held in the hand, as it allows the enemy to get dangerously near; it is, however, admirable as a throwing or missile weapon. Such knotted throwing-clubs, short-handled, are found in the *kerry* of the South African.

Thrusting weapons.

A stick which happened to have a sharp end made a far better thrusting weapon than another. So long as the sharpened stick was held in the hand and was of considerable length, it would be one kind of spear; when, however, it was hurled from the hand it became a dart or javelin. Rude men in various parts of the world have learned how to hurl such sharp-pointed stick, by means of another stick peculiarly shaped and formed for the purpose; such are the Australians, Eskimo, and the old Mexicans.

Devices for hurling spears and darts.

Another way of hurling such spears or darts was by means of a loop of cord or string.

Such devices add to the force and surety of the aim. Again, many peoples have learned to hurl small darts or spears, called arrows, by means of a combination of a cord and an elastic stick which we call a bow. Such, briefly and imperfectly, is the history of the stick seized for a weapon.

The stone.

The other primitive weapon—the stone picked up from the ground—has also had an interesting history of development. It could be used in two ways—held in the hand for fighting at close quarters, or hurled to a distance. By fastening it, by cords or gums or other methods, to a handle, the arm is lengthened and the weapon reaches to a greater distance, still remaining within control of the user; thus handled, it is first a maul; sharpened to an edge it becomes a battle-axe. The stone hurled from the hand is a very simple thing; it, too, may be sharpened, and by the sharpening it gains effectiveness. Instead of simple hurling from the hand it may be directed to its aim by means of a stick or cord, or by a veritable sling. The bullet is really only the stone of lead hurled by an elaborate engine.

It is often difficult to say of some weapons whether they have been developed from the stick or from the stone. The boomerang is plainly the former while the bullet is just as plainly the latter; which, however, shall we call the little arrow shot from the blow-gun? Where a missile is thrown from some sort of an engine it is not altogether easy to say how we shall apply the word weapon. Is the gun a weapon? Of course the real weapon is the bullet; the gun is simply an artificial hand serving to hurl it more rapidly and securely, using, instead of muscle power, the explosive force of powder.

Adrien de Mortillet's classification of weapons.

We have suggested a classification of weapons based upon the primitive forms used by early man. They may be classified in many other ways. Adrien de Mortillet, in his lectures, has classified them, according to form or mode of action, into three

types—weapons for dealing blows, pointed weapons, weapons with cutting edge; each of these he divides into three groups—weapons to be used in the hands, weapons fastened to handles and to be held in the hand, and missile weapons. His table is here reproduced:

TABLE OF OFFENSIVE ARMS.

1. For dealing blows.

Hand . . . . . Club.
In handle . . . . . *Casse-tête.*
Missile . . . . . Sling stone.

2. Pointed.

Hand . . . . . Poignard.
In handle . . . . . Spear.
Missile . . . . . Arrow or dart.

3. Edged, Cutting.

Hand . . . . . Sabre.
In handle . . . . . Hatchet.
Missile . . . . . Boomerang.

Discussion of table.

This table does not pretend to be a complete list of weapons; it aims simply to divide all weapons into a few classes and to present a single type of each. It may be interesting to examine a few of the types named. We have already referred to the club. The war-club of wood reached its most complete development in the islands of the Pacific. Among the Polynesians, Marquesas Islanders, Mangaians, and others, it becomes an elaborate and beautiful piece of work. The heaviest, hardest, finest grained woods available are used; the handles or shafts, long and smooth, terminate at one end in a carefully worked head, frequently elaborately carved; the designs at times are symbolical and full of meaning. Another district where the war-club—this time much shorter, and rectangular in section, but still covered with carvings—is exceedingly developed, is Guiana in South America. The little short club with large knobbed end used in Africa we have already

The club.

mentioned; it is called a "kerry" and may either be held in the hand or hurled.

The *casse-tête* is simply a pebble of stone fastened to a handle; it really reproduces the knobbed club, made from a single piece of wood. It is an ancient type, and *casse-têtes* of stone mounted in handles of horn were used by Neolithic man in Western Europe. Many Indian tribes in North America used such war-clubs or mauls; the Sioux still mount rather neatly-made stone heads upon long handles. The *casse-tête*.

Any pebble may be picked up and hurled. The hand, however, is not the best instrument for slinging stones, and among many peoples, and very anciently, we find the use of true slings. The simplest sling that can be thought of is a stick of wood near one end of which is a hollow, in which the stone may rest. The stick taken at the other end is swung and the stone thrown forward. There can be no doubt that it was a sling of this kind which is mentioned in the record wherein David is described as killing the giant Goliath. To-day in Palestine the shepherds use slings consisting of two cords fastened to a netted rest in which the pebble lies; the whole is whirled around and then the stone released by letting go of one of the cords. It may be asked why, seeing that such are now in use in Palestine, we should believe the other kind was used by David. The giant is recorded to have said to the hero as he advanced to meet him, "Am I a dog that thou art come with staves against me?" Surely, then, David bore a stick or staff; it would hardly have been his shepherd's staff, as there would be no object in taking that with him when he went against an enemy; it is more likely to have been the simple ancient stick for slinging stones. Slings.

The way in which the poignard may have been developed out of the stone spear-head and the forms into which, in time, it may have developed are sufficiently described elsewhere. Regarding the spear, however, there are many things of interest. The spear.

The shaft is heavy or light according to the purpose and the mode of use. The head may be simply the sharp point of the shaft itself; it may be a separate piece of wood or bone, short and sharp; it may be a second, long and slender, piece of wood inserted in the end of the shaft or lashed firmly along its side. The point may be simple, or it may be jagged and barbed so as to increase the wound and to render the removal of the weapon difficult; it may be attached firmly to the shaft, or it may be so secured as to be easily broken from it; the point may be single, or there may be several points projecting in various directions, about the shaft. The Eskimo make dainty little bird-spears, which in addition to the single point at the end of the spear have two or three prongs spreading outward, attached at one third or one half the length of the spear from the lower end; when such a spear is hurled at a flock of birds, if the main point misses its aim these barbs are almost certain to transfix a victim.

The spear-thrower.

We have mentioned the fact that a stick is sometimes used in hurling spears; it has been called by modern writers the throwing-stick or spear-thrower; it is the *atlatl* of the old Mexicans. It consists of a stick of from twelve to twenty inches in length, adapted to being held in the hand, with a peg or other rest for the end of the spear at the extremity remote from the part held in the hand; the shaft of the spear rests along the upper side of the stick, which is held horizontally; a quick movement launches the spear through the air. Professor Mason has paid attention to the spear-thrower, describing in great detail the various forms which it assumes throughout the Eskimo district. Since his paper, Uhle in Germany has written on the same subject, Mrs. Nuttall has fully described the *atlatl* of the Aztecs, and Adrien de Mortillet has called attention to the very ancient spear-throwers which have been found in French caverns, comparing them with the spear-throwing sticks of the Australians.

Among the many curious types of weapons used by rude peoples we shall consider a few: the bolas, missile knives, harpoon, pellet bow, and blow-gun. The bolas in its best-known form is found in South America. It consists of two or three round stones, encased in some kind of covering and hung at the lower end of cords which are knotted together at the upper end; it is used in catching cattle. The hunter, usually on horseback, sets the pebbles whirling and launches the whole series out into the air toward the game. When one of the cords strikes the beast the ball whirls on, winding the cord around and around the creature's leg; another ball is doing the same to another leg of the animal, with the result that he is rendered helpless. The bolas in another form, composed of smaller pebbles and more of them, but in principle the same, is used among the Central Eskimo in catching birds. Africa is the great district of missile knives. In that country of skilled work in iron, knives are made in the strangest forms, having a little handle, radiating out from which in various directions, but all in one plane and made from a single sheet of metal, are several cruel, sharp blades; such knives are hurled through the air at the enemy, and in their whirling one or the other of the blades is quite sure to strike the victim. Among the Sikhs of India a weapon is used, consisting of a round ring, thin but broad, of iron or steel, which is ground sharp around its whole outer edge; sent whirling rapidly through the air such a weapon might do considerable execution.

The bolas.

Missile knives.

The pellet bow is a curious modification of the common bow; instead of arrows, round balls the size of a large marble are used as missiles; the cord of the bow is double—or rather there are two cords side by side; at about their middle point these are united by a little rest of netted work in which the pellet is placed; of course, if the bow were symmetrical over the cord like a common bow the pellet would strike the back

The pellet bow

of the bow itself—consequently in the construction of the bow this danger must be avoided. There are few instruments which have so curious and so definite a range in distribution as the pellet bow; it is known among the islands of Southeastern Asia and among the Indians of Paraguay.

The harpoon.

One of the most perfect devices in the way of spears which man has ever invented is the harpoon, found throughout the Eskimo district and used in the hunting of large game. As chiefly used by a man sitting in his boat, it must possess qualities not needed in the weapon used on land; it consists of a heavy shaft to which is attached a point, usually of considerable length; this point is fastened to the shaft in such a way that when the game is struck it separates, remaining in the animal while the shaft floats upon the water and can be easily secured; the point is also fastened to a cord which is connected at its further end with a bladder or skin filled with air; when the game is struck, it dives, the cord reels out until the bladder floats upon the water; the wounded creature tugging constantly against the air-filled bladder is quickly worn out and captured. In throwing the harpoon the spear-thrower is used.

The blow-gun.

One of the neatest weapons found among rude tribes is the blow-gun. It consists of a long, straight, hollow tube—generally a bamboo or cane of some sort; the missiles thrown by it are light arrows—little slender shafts, sharp pointed at one end and bound at the other with a wad or plug of some soft stuff, like cotton or thistle-down. This plug is of such size as to fit neatly and with a little pressure inside the tube. The sharp point very commonly, in the islands of Southeastern Asia and in South America at least, is dipped in poison. The arrow is placed at one end of the tube, which is then raised to the lips and pointed to the game; a sharp, quick, but not remarkably strong puff of breath sends it on its noiseless flight. We have seen the blow-gun in use among the Cherokees of Carolina.

They use for tube a cane eight or nine feet in length, which they carefully clean and smooth within. Their arrows consist of a shaft of about sixteen inches in length, made of hard wood and cut to a point at the upper end. The plug at the lower square-cut end of the shaft is made of down from a burr much like a species of thistle; this plug is as broad as the diameter of the tube and is perhaps three inches long. The way in which the bits of down are attached and wrapped is very pretty. We have seen such blow-gun arrows do execution upon rabbits at a distance of a hundred yards—passing quite through the body of the creature. Such are a very few of the ingenious weapons of savage and barbarous folk. We have simply tried to illustrate their diversity and adaptedness.

The Pitt-Rivers Museum.

At Oxford is the Pitt-Rivers Museum. In many ways it is unique; in all ways it is of interest. There one may see, more carefully worked out than elsewhere, the history of many a device. The development of pottery, of basketry, of weapons, of tools, of ornamentation, may be traced step by step. The museum is the development of an idea which occurred long ago to Col. Lane Fox—now Gen. Pitt-Rivers. He was interested in guns, and as a matter of personal interest and curiosity secured a series of specimens to illustrate the development of our modern gun—from the old matchlock through the flintlock to the modern rifle. This series formed the nucleus of the present great museum illustrating progress.

Boys and bows and arrows.

We have elsewhere spoken of the savagery of childhood. We might find it illustrated in every topic considered in this book. It will be unnecessary to refer repeatedly to the matter. We may, however, at this point call attention to the way in which among boys many of the ancient weapons of mankind still linger on in civilization. The boy with sling-shot or with sling, with bows and arrows, with darts, is only living once again the life of his ancient and savage ancestors.

CHAPTER XIV.

Dress and Ornament.

We do not often stop to ask the reasons for our most common things; nor do we think much in regard to origins. It seems to us that certain things are natural; that they must always have been just as they are now.

What possible origins for dress?

How did dress begin? Why do we wear clothes? The answer, no doubt, comes at once—to cover our nakedness; to meet the demands of modesty. If we were still further pressed to answer the question we might say that dress is a protection against climate and attack and injury; still further pushed we might reply that dress is ornamental, a decoration, a distinction. There is no doubt that more or less of truth is found in each of these three answers, but we believe that the most important one is the latter, not the first. In other words, dress began not as a modest covering but as ornament.

Ethnic mutilations or bodily alterations.

We have already, elsewhere, discussed the matter of dress in a series of lectures, which have been published. We shall here only briefly summarize what we have said in those. It is well known that, among many people in order to meet the dictates of fashion, or for some other reason, it is customary to change the body more or less profoundly. These modifications or alterations may affect almost all portions of the body.

Lip-piercing and labret-wearing.

The Haida woman pierces her lower lip, in order that she may therein thrust an ornamental plug or labret. When a girl she is taken by some female relative into the woods, where a hole is punched through the lip by means of some sharp bit of shell or stone. A grass stalk or a splinter of wood is thrust through to keep the wound open. When the soreness resulting

from this operation has disappeared, this stalk is removed and a larger bit of wood thrust into the opening, which is stretched by it to a larger size. In time this peg is replaced by a larger block, and so on, until, at last, as an old woman she may wear a labret five inches in one diameter and one and one half in the other, which holds her lip out horizontally. The wearing of labrets is by no means confined to the Haidas. The Aztecs and other Mexican tribes wore them and here it was men who made use of them. Curious little plugs made of obsidian or amethyst or rock crystal, shaped something like a stovepipe hat, the brim of which was inside the lip while the cylindrical portion protruded through the opening in it, are among the commonest ancient relics from Mexico. So, too, in South America, among such tribes as Botocudos, round blocks of wood sometimes as much as three inches in diameter are worn. In Africa, too, the wearing of labrets of various kinds, in the upper or lower lip or both, may be found among many tribes.

Nose-piercing.

The nose may also be used for bearing ornaments. It may be pierced through the septum or division between the nostrils, or holes may be made in the wings, and, through the apertures thus formed, ornaments of various kinds may be thrust. The Eskimo pierces his cheeks in order that he may wear a pair of studs of bone or stone through the openings. The mutilation of the ears is found everywhere among savage and barbarous peoples. Holes may be made to which ornaments are hung or the ear itself may be slit and drawn down into great loops which are thought by some people, such for instance as the Anchorite Islanders and Fijians, to be particularly beautiful. It is said that a Fijian's ears, after they have been slit, might be drawn down in a loop to that extent that his two clenched fists might be thrust through the loop at one time. Such slit ears are not only ornamental; they may become truly useful, as among the Kaffirs, who sometimes carry their snuff-boxes in

Cheek studs.

Ear-piercing and slitting.

their ear-holes, and among the Mangaia Islanders, one of whom is described by an early traveler as having been clothed with a hunting-knife, which was thrust through the lobe of his right ear.

Tooth-filing, etc.

In various parts of the world, as Africa, Australia, Malaysia, Mexico, and Central America, the teeth have been changed. They may be filed into points, certain teeth may be broken out, or holes may be drilled through them and decorations driven in. Such alterations of the teeth are very commonly tribal marks; this is particularly true in Africa, where a man belonging to a tribe can often be recognized by the way in which his teeth have been chipped or filed or broken.

Bandaging:

Not only may the body be changed by means of mutilation; it may also be modified by bandaging. Every one knows of the little feet of the Chinese women, produced by bandaging them so as to prevent growth from infancy. The Chinese foot is but a single sample of a variety of modifications of great interest. Head-shaping is one of these and is to be found very widely over the world and has been practiced from a very distant time. The shape of head produced varies from tribe to tribe and serves to distinguish classes in society or to separate tribes.

Of feet;

Of the head.

Skin decorations:

Quite as curious as these modifications are the various patterns which are worked out upon the skin. Every one has seen more or less of this body-painting, which is not exclusively confined to savages. Schweinfurth found African tribes among whom the women painted their bodies completely over with two kinds of colored clay. Designs were scratched through the outer coating showing the other color. Thus these ladies would appear with their bodies covered with zigzag lines, checker-board patterns, and zebra-like stripes, the colors being a grayish white and a purplish tint. The North American Indians, of course, paint for their dances, and we have seen Sacs

(*a*) Painting;

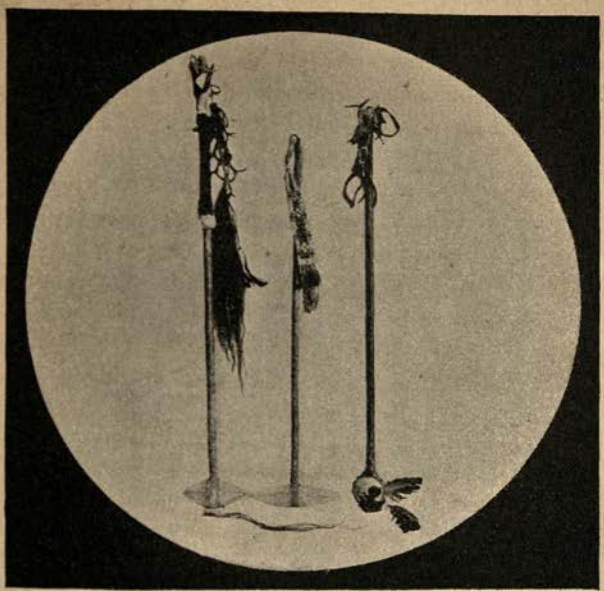

FIG. 17.—SIOUX INDIAN STONE WAR-CLUBS, MOUNTED.

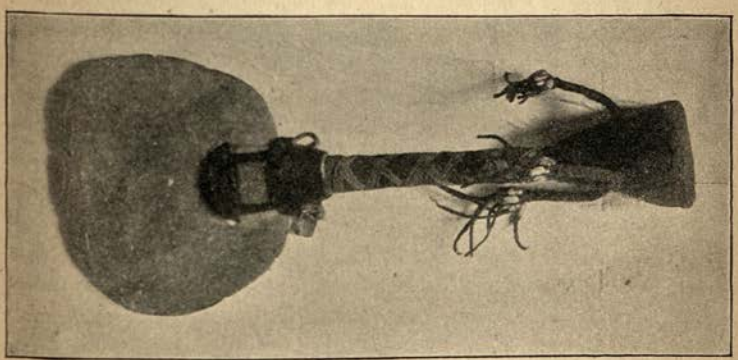

FIG. 18.—CEREMONIAL AXE OF STONE, MOUNTED. New Caledonia.

and Foxes with most elaborate face-painting; one man appeared with one half his face bright yellow and the other half a brilliant green; another had his face painted black, except about the mouth and eyes where there were disks of scarlet, while on his forehead was a network of fine yellow lines.

The great objection to all body-painting is that it wears off too quickly and frequently needs replacement. How desirable then that the color pattern should be rendered permanent. This is accomplished by means of tattooing, which may be done in several ways: the pattern may be pricked in with points dipped in color; it may be cut in with a knife and color rubbed into the lines; it may be sewed in by drawing thread, which has been dipped in color, under the skin. The Japanese once tattooed their bodies completely; the Polynesians were artists, and among them very commonly the tattooing had a meaning, every line possessing significance. We have not space to cite further examples. The third method of marking the skin with patterns is known as scarring, or gashing. Many an African tribe marks its boys for life by patterns produced by cutting great gashes on the face or body and rubbing into the wounds wood-ashes, which causes swelling and healing with a purple color.

(*b*) Tattooing;

(*c*) Gashing.

Among modifications of the body hair-dressing is of great interest. Many peoples are characterized by their mode of wearing the hair. In Africa there are astounding trophies of this art. The Chinese cue is well known. The Siamese brush or tuft—the lotus blossom—is characteristic.

Hair-dressing.

Now, how shall we explain all these peculiarities? What is the meaning of such modifications? At present, no doubt, many of these are simple fashions, but in their beginning we may be sure that every one was intended to distinguish the individual from his neighbor. The man who had killed a beast, or an enemy in war, would leave the blood on as long as it

Origin of modifications of the body.

would stay, to show his prowess; when it was gone he would replace it by red pigment. The man who had been scarred or scratched in battle would be proud of his wounds and show them on every occasion. The man who had been equally brave but who had not been injured would have gashes made upon him. The beauty and attractiveness of all these things is subsequent, not precedent; they are now fashionable; they were once individual and marked off the brave man, or the strong man, from his fellows.

Is dress at first due to modesty?

Coming now to dress itself, we have before us the threefold possibility of origin already stated. If dress is due to an instinctive modesty, two or three things, it seems to us, should be true concerning it. First, there should be no naked tribes. Yet, there are naked tribes even to-day, and only a few years ago the number was much greater than at present. Secondly, if shame is innate, modest dress should be the same the world around; in other words, there should be some one ideal as to what constitutes modest dress. Yet, we find the strangest variations in this matter; in China a woman must not let her little feet be seen; Hottentot women are ashamed to let their hair escape from the cap worn upon the head; some Arab women would be dressed completely if the hair upon the back of the head were covered, while they would be immodestly clad, although both body and face were completely enshrouded, so long as that hair were shown. Thirdly, if dress is due to modesty, we should suppose that those peoples among whom dress was found to be a completely modest covering would be the most modest and moral of mankind. But, it is true that many a naked woman in Africa is entirely modest; and it is also true that the Japanese, than whom there is no better dressed people, are highly immoral and immodest. We find, then, that this so-called innate modesty which impels to dress has left whole tribes unclad, has given rise to no constant ideal of modesty in

dress, has permitted modest people to go unclad, and induced immodest, immoral folk to clothe themselves most beautifully. In other words, it seems to us, there is no such innate primitive impulse to clothing.

It would not be difficult to construct an even stronger argument against the idea that dress has been derived from the need of protection. It is true that dress frequently is such, but it is also true that in many districts, where dress might well be needed as protection against inclemency of weather, it is conspicuously absent. Charles Darwin speaks of seeing Fuegians standing naked, save for a little piece of skin of some beast worn upon the shoulders, while the driving sleet froze on their bodies. It is true that the skin spoken of was shifted from time to time as the wind varied.

Is it due to need of protection?

While there are people whom modesty has never driven to cover themselves with clothing, and while there are others who will stand a winter's storm without protective garments, there are no people but what have ornaments. These ornaments are most primitively trophies of the chase. A man kills some beast and uses teeth, claws, or skin to hang upon his person to remind others of what he has done. Curious and unusual objects are added to these trophies; parts of shells, bits of stone, bright flowers. These may be thrust into the holes which he has made in his own body or may be hung by cords about his person. These are ornamental, though *we* may not consider them beautiful; they serve to mark one man off from another; they are distinctions. In time the objects thus carried on a person may become numerous. Lippert calls attention to the fact that all such ornaments are of two kinds—they are either attached ornaments or hung ornaments. A labret thrust into the lip is one of the former class, while an object of any kind hung by a cord about the neck represents the second. Lippert also calls attention to the fact that there are certain

Ornament as a motive to dress development.

Origin of wearing ornaments.

parts of the body about which cords for carrying ornaments may naturally be placed; such are the head, the neck, the arm above the elbow, the wrist, the waist, the leg above the knee, the ankle. If we look at the decorative objects used by savage and barbarous people over the whole world we find samples of ornaments worn at all of these various spots. There are, however, some which are not convenient; there are others where the ornaments may be borne with ease. The two most notable are the neck and the wrist, and we find the neck and wrist-bands particularly developed as ornament bearers. Thus, of a Kaffir dressed for a visit, it is said that he "ties so many tufts and tails to his waist girdle that he may almost be said to wear a kilt." The neck girdle can also be developed to as marked a degree. We all know how strongly one feels the absence of a thing to the wearing of which he is accustomed; for example, the man who has forgotten to put on his customary necktie feels a degree of chagrin and shame quite disproportionate to the importance of the matter. Is it not certain that a people who had been used to wearing great masses of ornaments attached to neck and waist girdles should feel ashamed if perchance at any time they were left off? In other words, is not shame for nakedness due to the absence of the customary covering, and does it not arise later than dress, instead of preceding it? To a fuller consideration of this whole matter we must refer elsewhere.

Hung ornaments.

Shame for nakedness subsequent, not original.

The same German author to whom we have before referred recognizes two types of dress, the northern and the southern type. The former has in its shape and development been influenced by the desire for protection. It is the clothing worn by the north of Europe. It consists of a close-fitting jacket and a tight pair of trousers or skirt. It is, perhaps, derived out of the practice of tying skins about the person. According to our theory, it would have begun with throwing skins of animals

Lippert's two types of dress.

that had been killed in hunting over the shoulder or upon the back as trophies; in time the protective value of these skins would be discovered and their original distinctive meaning would dwindle. Tied about the person for convenience, they would suggest the forms that characterize the north type of dress.

The southern type of dress is loose and flowing. It consists usually of two pieces, a loose and wide-sleeved jacket and a loose and flowing skirt or pair of trousers. It is the dress of ancient Egypt, of the old Greeks and Romans, of the Chinese, Japanese, and Persians. According to the theory we outlined, it is the ornamental girdle of the neck and waist developed. The skin trophy and the girdle with its heavy burden of ornaments is replaced after weaving begins by a mat or piece of cloth. Its forms are derived simply from natural draping of the material used. Lippert also discusses how, in Europe, the northern and southern types of dress once came in conflict. It was in Italy, when the northern barbarians swept down upon the sunny South and sacked the imperial city. At that time all, both men and women, civilian and religious leader, wore the loose and flowing garments of the southern type. The common men of every-day life and activity adopted the more convenient dress of the northern barbarian; but the women, blessed conservators, clung to the old. Perhaps you never queried before why men and women among ourselves dressed so differently. There is, however, a second great conservative power in the world, and just as the women retained the old southern type of dress in ancient Rome, just so the priest retained it also; and every time one sees the priest of the Church of Rome or of the Church of England in his official gown, it tells the story of survival in religious rite and ceremony.

Conflict between the types.

If we should examine the garments daily in use among ourselves, we would discover in it many curious and interesting

"Survivals" in our modern dress.

survivals in culture. Tylor has shown us the history of the swallow-tailed coat. It is all that is left of the olden-time gentleman's long coat, after it had been adapted to horseback riding. The long coat was proof of respectability—the badge of a gentleman—but it was not convenient when one got into the saddle; hence it was cut away in front to give the knees freedom and was slit behind so that it could be lifted and buttoned up to two conveniently situated buttons, thus preventing it from too soon wearing "shiny"; nowadays when a man wants a riding-coat he has one made expressly which is convenient and sensible. To show, however, that he is really a gentleman he retains for a dress-coat the old riding-coat with its cutaway front, its slit back, and even its two once useful, now useless, buttons. Even gentlemen in the olden days could not afford to dress their servants or valets in brand-new garments. The *old* riding-coat passed to the body-servant. It came naturally to mark alike servant and master. Servitude is conservative. Hence, when a gentleman to-day, clad in his old-fashioned riding-coat goes to some social event, he is met at the door by the servant clad in the ridiculous cast-off garment of the past. A stranger to our customs might be unable to recognize which was which!

Look at a boy's "knee pants." There are usually two buttons on the outer side of the legs near the knees. What are they for? Ornament? Hardly, for one scarcely notices them until attention is directed to them. Are they functional? Not commonly: usually no buttonholes are present. The truth is that among the ancestors of the boy knee pants were in style. At that time also gentlemen were proud of shapely legs and garments should fit closely to show these to advantage. Accordingly the short trousers were slit at the side, and buttons and buttonholes placed along the slit; the garment could then be drawn on and buttoned after it was in place. Those

days are long past, but the boy, reproducing in this respect his great-grandfather, still wears the knee pants with buttons on the sides silently reminding us of the past. Many more such survivals in our dress would present themselves to a searcher.

Diligence of primitive man in finding dress materials and ingenuity displayed in turning them to use.

As in the matter of food-getting we were impressed by primitive man's diligence in seeking out nature's gifts and learning how to use them, so here in the matter of dress we are constantly astonished at the way in which the world has been ransacked for materials and at the ingenuity displayed in devising processes of making them up. Skins of bird, beast, fish, and reptile have been used; feathers, hair, bones, teeth, horns, shell, ivory are among the dress materials supplied by the animal kingdom; leaves, fruits, flowers, fibers, bark, and wood are furnished by plants; even the mineral kingdom yields metals, gems, and stones. Some Eskimo make beautiful garments from the feathered skins of owls; furs used generally by savage hunters *survive* in the dress of civilized woman; fish-skin garments are worn among the Ainu; curious water-proof jackets are made by Aleuts from the intestines of the seal.

Feathers are favorites everywhere. The wild man of South America, who desires a bright feather to stick into his nose or cheek, unites with the belle of civilization, who wishes a breast or a plume for her hat, in demanding the slaughter of bright birds. Both show an equally barbarous taste. Some of the loveliest garments ever made were of feathers. The old Hawaiians were masters in making helmets and cloaks in brilliant red and yellow feathers, and the Indians of South America—in Guiana, Brazil, Ecuador, Paraguay, etc.—delight in feather aprons, head-dresses, and staves. The old Peruvians were equally skilful, and Giglioli has recently described some admirably made pieces in the Mazzei collection from Peru.

Hair of various kinds has been twisted into cords, woven into cloth, or beaten into felt by various peoples. Bones of

the toucan are made up into network aprons by the Jivaros of Ecuador, and the beaks of the same bird are strung into necklaces in Paraguay. The use of silk was early learned by Chinese.

Influence of the desire for dress in originating and stimulating certain practical arts.

The desire for dress or adornment led to the origin of several important arts. Skin-dressing began early, and even with rude methods the Kaffirs in South Africa and the various tribes of North American Indians have produced some marvelously soft and fine pieces. Beating of bark-cloth and making of felt are simple, but interesting processes. Braiding or plaiting of splints into mats is a very old art; it is the same thing as basketry. Some Australian women wear such mats. But it passes, with cords made of bark or other fibrous vegetable matter, into a rude sort of weaving, and the mantles of *Phormium* in New Zealand and of cedar bark among the Tsimshians are very soft and flexible. One step further on in the same direction lies the art of spinning fibers into true threads and that of weaving these into real cloth. There appears to be reason to think metals were first attractive because of their beauty and were first used in making ornaments. Metallurgy with all its wonderful and important applications is the result of vanity and desire for display.

CHAPTER XV.

HOUSES.

IN MANY places nature has already made houses for man. Thus, in South Africa the Bushmen live in holes and crevices among the rocks. Caves and caverns have always been comfortable houses. Long ago, in France, hundreds of these caverns had been taken possession of, and to-day as the cave earth and stalagmite covering their floors are dug up we may see just how the old cave-dwellers lived. They were very rude folk, using flint for tools and bone and horn for weapons. They were artists, too, in a certain way, and had a passion for carving on the bone and ivory of the animals they killed representations of beasts of many kinds. Sometimes, at least, they appear to have dressed in garments made of skins; these perhaps were sewed together with needles of bone threaded with sinew. They daubed themselves with color, and fragments of their old red and black pigments have been found. They knew the use of fire and perhaps knew how to boil meat in water heated with hot stones. They were fond of ornaments, wearing necklaces composed of teeth carved with various designs. They were hunters, using arrows, spears, harpoons, the heads of which were made of bits of bone or antlers. We can tell the kinds of animals they had for food; fragments of their bones are scattered through the caverns; they were often cut and notched by the stone knives when the meat was being removed, and many of them were broken so that the man might get the marrow they contained. Thus we have a picture of the life of the old cavemen who passed away thousands of

Caves as homes.

Cave-dwellers of France.

years ago. Much later on, men of the Neolithic period dug out in the soft rock in the Marne Valley comfortable houses—copies of natural caves.

There has been much discussion as to what became of the cavemen of France. Some authors, among them Dawkins, believe that they followed the retreating ice of the glacial period and the reindeer whose herds followed it in its withdrawal far to the north, and are to-day the Eskimo. It is true that there are many things in the life of these little northern folk to remind us of the ancient Stone Age man of France; they live generally by hunting, using bone and horn for tips of lances, spears, harpoons; they have a passion for carving bone or ivory, and delight in representing animal forms in their artistic efforts; the patterns of their tools are frequently strikingly like those of the cave-dwellers. Those who hold to such a view see in the curious gallery huts of the Eskimo reproductions of the old cave houses. The Eskimo house is built either of stone, of earth, or of blocks of ice and snow; in either case, it consists of a long, low gallery, through which one crawls or walks with difficulty, opening into a larger room, which is generally covered by a dome-shaped building. Such a building does, in more than one respect, suggest a cave house; its form, however, is so well adapted to the conditions of the land in which the Eskimo lives, that it may be questioned whether, after all, it would not have been independently developed in such regions, by a race which never had inhabited caves.

The Eskimo gallery hut.

But nature is not always kind enough to furnish houses ready-made and most men make houses, more or less serviceable. They may be the rudest sort of shelters. Thus Tylor says: "In the depths of Brazilian forests travelers have come upon houses of the naked Puris which are not even huts, only sloping screens made by setting up a row of huge palm leaves some

eight feet long, leaning against the cross pole. . . . . Even in these tropical forests what is generally met with is the real hut, though it may be such a rude one as the Botocudos make with these same great palm leaves, sticking a number of them with their stalks in the ground in a circle, and bringing their points together so as to form a roof overhead. Patachos go to work more artificially, bending together young growing trees and poles stuck in the ground so that by binding their tops together they form a framework, which is then thatched over with large leaves." These are samples of the rudest huts which man constructs and such are found the world over. Of all places, however, for studying construction of huts, Africa is the very best. There one may see samples of everything that can be thought of in the way of circular houses; built of straw, sticks, leaves, matting; of one room or of many; large or small; crude or wonderfully artistic and carefully made. They may be permanent constructions to be occupied for years or temporary shelters for a single night; they may consist of frameworks made of light poles over which are thrown mats or sheets of various materials and which after using can be taken apart, packed away, and transported. A settlement of Hottentots consists of a circle of such light houses, easily erected and as easily removed and transported, enclosing a space in which the cattle are kept at night.

Rude huts and shelters.

Africa, the land of huts.

Dome-shaped houses, built over a light framework of poles, are found also in North America; the winter home of the Sacs and Foxes is such an one. Slender poles tied together with cords or strips of bark are covered with sheets of rush matting. In such a hut to gain warmth everything is crowded into the smallest compass. Insufficient as such a home appears for the wintry days of December and January in Iowa, they are by no means a bad protection. One of the most ingenious houses made by ruder peoples was the tent

Indian huts and tents.

of our Plains Indians, in the good old days when herds of buffalo abounded. The framework consisted of poles which were set up into conical form and over which was stretched a covering made by sewing hides together. A hole above for the escape of smoke was guarded by a hood or flap whose position could be changed as the wind varied. The skin could be removed and the poles taken down and packed for transportation by dogs or ponies in a very few minutes. Tents of skin or felt, very different in form, however, from the Indian type, are used among many of the nomad tribes of North Asia. No doubt the ancestors of the Chinese used such. Violet le Duc thinks that in the curious projecting bamboo sticks, which one sees along the edge of Chinese house roofs, we have left in copy the projections of the edges of old tent roofs to which cords were attached for stretching.

As Tylor says, the low, dome-shaped hut in its simplest, rudest form leaves little space for people who enter to stand erect. There are two ways by which it may be heightened—excavation of the floor or raising of the roof. We find the former among that curious population at Shikotan observed by Hitchcock. These people dig a pit of some depth which, at top, they wall around and cover with a roof. In such houses, Hitchcock thinks he finds survival from the time of the old pit-dwellers, "earth spiders," referred to in old Japanese legends. In Japan, also, we have an illustration of the other mode of increasing the height of the low and simple hut. The Ainu method of building a house is, first to build the roof and then to raise it up on poles and put a wall below it. There are many devices for rendering the walls close and tight; thatch, interlacing twigs, daubed mud, all play their part.

Huts of Japanese "pit-dwellers";

Of the Ainu.

Wall construction.

Many years ago, in Switzerland, there dwelt people who built their towns over the surface of lakes, setting them on piles or posts. They are called Lake-Dwellers. They lived during the

Swiss Lake-Dwellers.

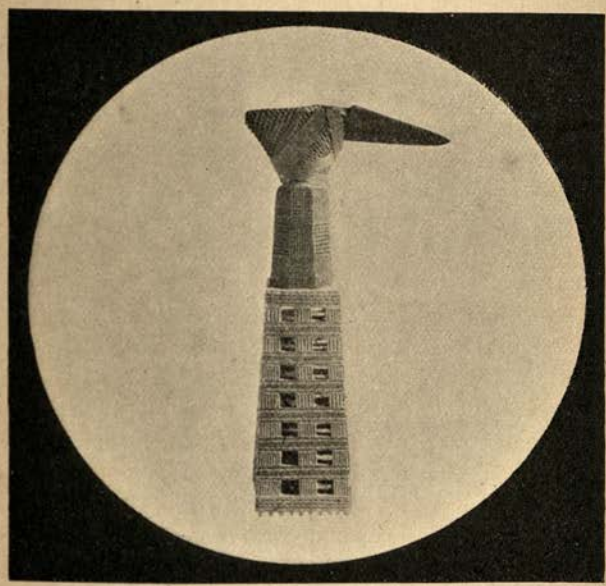

FIG. 19.—CEREMONIAL AXE. Mangaia Islands. To show mode of hafting.

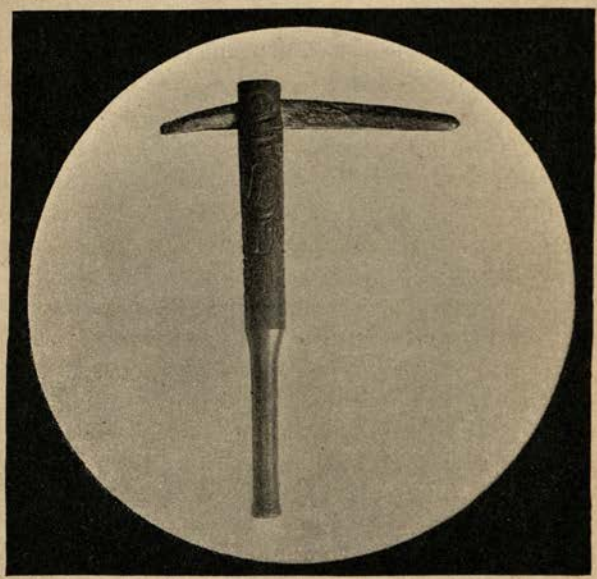

FIG. 20.—WAR-PICK. Alaska. To show mode of hafting.

later Stone Age, through the Bronze Age, and into the early Iron Age. Their villages were frequently of great extent; as many as one hundred thousand piles are said to mark the site of one of them. The piles might be driven into the bottom of the lake, or they might be steadied at the bottom by stones and earth thrown down for packing. They bore platforms on which were built the houses. These consisted of vertical posts and poles which were filled in solidly with intertwining twigs and little branches; the whole was daubed thickly with clay; the roofs were thatched. There has been much argument regarding the outside form of these old houses—whether they were circular or square—but the probability is that they were usually rectangular. Lake-dwellings are not entirely a thing of the past. In Venezuela and in New Guinea particularly there are still towns built on posts over water. Nor are pile houses confined entirely to lakes or seas; there are districts in the Malay region where houses are built on piles raised to a considerable height above the dry land itself. In such cases, security is gained against animals and other dangers.

Stone houses.

Leaving huts, we come to houses proper, with walls built of wood or stone or brick. Stone walls, no doubt, are very ancient and have been built by many people in a low stage of culture. These walls may be built of stones selected so as to fit closely; they may consist of flat stones, which are easily laid up, one upon another; or they may be made of stone artificially shaped so as to fit neatly. They may be laid up dry, or they may be set in mud, or in some cement which hardens and adds strength and firmness to the construction. In districts where stone is not abundant, cement may form a very large proportion of the mass. Thus we may have walls consisting mostly of mud or cement in which bits of stone or gravel are mixed. The walls of a house built long ago in Mexico, which we recently saw excavated, were composed of mud through which were scattered

bits of lava, forming in some places only a small proportion of the mass. In Egypt and parts of our own southwestern country, nature supplies—in certain fine-grained clays—the best materials for house construction. All through southwestern Colorado, New Mexico, Arizona, southern California, we find the houses of the common people built of adobe. In a district with so dry a climate as these states possess walls composed of sun-dried bricks last for years.

Some Indian houses.

The Iroquois "long-house."

Morgan, in a work entitled "Houses and House-Life of North American Indians," describes many homes of our native tribes. The Iroquois long-house attracts his attention; rectangular, with vertical walls and pitched roof, it was several times longer than broad. A doorway was at either end. The house consisted of a framework of poles covered with great sheets of bark. The house was occupied by many individuals, all of one blood. Little groups of persons most closely related to each other had each its proper portion of the house and its own fireplace. The house was divided by partitions into as many sections as there were such groups. The partitions did not extend entirely across the house but simply marked out little stalls. Among the Mandans, Morgan found great circular houses. Here, too, many people lived within a single house and the place of each group of near kin was fixed as in the other case. In the Southwest—New Mexico, Arizona—we find the Pueblo Indians living in great buildings, made of stone or adobe. These buildings consist of many rooms arranged in long lines or series. Looked at from behind they present a wall rising to a height of two or three stories; from the ends they look like sections across a great flight of steps; from in front they present a terraced form. If a building has three stories there are three lines of rooms below, one line before another. On the second story there are two rows of rooms, and the flat roof of the front rooms of the lower floor serve as a

Mandan houses.

The Pueblos.

platform to them; on the third story is a single line of rooms with the roof of the front rooms of the second story as their platform. Access to the various stories from one another is gained by ladders. In the olden times there were no doors or windows in the lower floor; one climbed ladders to the roof of that story and descended by other ladders through trap doorways. In Pueblo buildings, also, we find great numbers of related persons living together; little groups of nearest kin being nearest neighbors. This communal living in the great houses is one of the most marked features of barbaric life; it generally accompanies that social structure wherein woman-right prevails.

Communal house-life.

One matter of considerable interest regarding the houses of savage and barbarous people is the fact that in them there is a fixed place for each member of the family. Among some of our Indian tribes, one cannot more effectually disgust and antagonize the owners and occupants of a house than by walking in carelessly and taking his seat anywhere and everywhere. Every man, every woman, every child has its place for sitting, standing, sleeping. A guest should wait to be asked to sit in his appropriate place. Etiquette and ceremony begin very far down in human life.

Each inmate's place is fixed in such a house.

There is a notable tendency at the present time in all our greater cities to migration with the seasons. Most people who can afford it have both summer and winter homes. This is by no means a sign of extremely high civilization. The Indians of Kamtschatka have summer and winter houses almost adjoining and of totally unlike construction, the one being almost subterranean and the other nearly aërial. In summer the Sacs and Foxes live in rectangular houses of considerable size covered with bark; with doorways at either end; with high roof; with platforms for sleeping on either side, running the full length of the building and raised some distance above the ground. In

Summer and winter houses.

winter they live in the little matting-covered, dome-shaped, crowded, one-door lodges, which we have already described.

The character of the house is dictated by environment.

There is no matter in the life of any people which is so plainly and so markedly affected by natural surroundings as the home. The houses of old Chaldea were built of wood and sticks covered with mud; those of Assyria were made of stone. The former dwelt in a low and marshy, fertile country; the latter in a region where rocks abounded. Our southwestern country yields but little timber but has abundant clay and sunny skies; adobe rules. In Greenland gallery houses are built of dirt and stone, wood being scarce; still further west the Central Eskimo builds wonderful houses out of blocks of snow. Material, form, character, all are determined by the conditions of the country.

Examples of the law of copy in house-building.

It would be interesting to trace the operation of the law of copy among the houses of mankind. We have suggested that the Eskimo hut with its long gallery approach may be a copy of the ancient cave; that the projecting ends of bamboo in the Chinese roof recall the old-time tent-strings and their attachments; it has been suggested that the pillars of the temples of ancient Egypt—which have influenced the architecture of our world—were copies, in the land where stone abounded, of the bunches of reeds and papyrus which had been used for supports in houses built in other districts where marshes were common and where stone was lacking. Any or all of these claimed survivals may be fanciful, but any number of true survivals may be found in studying carefully any single type of house.

CHAPTER XVI.

Boats, Carts, and Sledges.

Value of tabulation.

It is sometimes helpful, for bringing clearly before one's self relationships and development, to tabulate objects of a certain kind. At various times our students have been asked to prepare such tables. One of these (prepared by Mr. J. R. Gow) we present herewith :

Table of boats.

- **Boats and Ships.**
  - **Forms.**
    - **Log.**
      - Dug-out, bow and stern, keel.
      - Bark canoe, with ribs.
      - Skin canoe.
        - Round—Coracle.
        - Kayak.
      - Wooden canoe.
        - Thin boards over ribs.
        - Modern ship.
    - **Raft.**
      - Many logs.
      - Bridge connecting outer logs.
      - Outrigger canoe.
      - Catamaran—Dover steamer.
  - **Propulsion.**
    - **Force on land**
      - Poling.
      - Hauling.
        - Stationary end on land.
        - Moving end on land.
    - **Force on water.**
      - Paddling with hands and feet.
      - Wooden paddle, single or double.
      - Oars, and oars with rudder.
      - Wheel at stern or at sides.
      - Propeller, twinscrews.
    - **Sails, or force from wind.**
      - Exposing body or boughs.
      - Mat on one or two sticks.
      - Masts with sails.
      - Convex and many-shaped sails.
      - Full-rigged clipper, etc.

- **Modifications of form due to**
  - **Nature of water to float in.**
    - River.
    - Canal.
    - Inland sea.
    - Ocean.
  - **Uses.**
    - Travel.
    - War.
    - Trade.
    - Sport.
  - **Method of propulsion.**
    - Oars.
    - Sails.
    - Steam.

Development of water craft.

While such tables are convenient, we should guard against the idea that they necessarily show the line of development. At times they may; but progress is not always steady and along lines that we lay out; the same result may be produced

by evolution along several different lines. The very simplest form of boats is the float. This may consist of a single log rid of its branches, or it may be some great branch with leafy boughs still on it. Some peoples make use of the buoyant power of bladders, inflated skins, or cocoanuts in getting across a piece of water. The Californian ties together reeds into a bundle and on it floats. In all such cases the first and simplest means of propulsion would be by paddling with the hands and feet. A man astride a log with hand and foot-power is the simplest conception of a boat.

Rudest floats.

The man who in California tied his bunch of reeds together, had already begun to make progress in shipbuilding; so had the one who found that pointed logs would make better headway than square-cut ones. The boat proper is only the old log in lighter, better form. It is still in use as the simple dug-out among many primitive tribes. Almost all Stone Age men have at some time or other made rude boats by simply hollowing out the upper side of a log. He usually invoked the aid of fire; first charring the place upon which he wished to work, he then cut out the charred portion with his adzes and chisels of stone or shell. Almost as primitive as the rude dug-out is the canoe of bark, made by some Australians and by the Fuegians. A great piece of bark is stripped from a tree, and simply tied together at the ends, leaving an open space above. The famous birch-bark canoe of the Algonkin Indians, consisting of a light framework over which is stretched birch bark, neatly sewed at seams and daubed with pitch to guard against leaking, is a great improvement upon such crude devices. Very similar to the bark canoe and quite as light are the skin-covered canoes—the kayak, or baidarka, of the Eskimo. In all these cases we have, really, a log made hollow, but constantly lighter and more convenient. No one could for a moment think of carrying a dug-out from one bit of water to another; the In-

The dug-out canoe.

Bark canoes.

The kayak.

dians and the Eskimo have no difficulty whatever in carrying their birch or skin canoes. It would be hard to find a boat more serviceable than this same skin-covered kayak of the Eskimo. Nansen describes the expertness which the Greenlander shows in its use. He says:

"You cannot rank as an expert kayak-man until you have mastered the art of righting yourself after capsizing. To do this you seize one end of the paddle in your hand and with the other hand grasp the shaft as near the middle as possible; then you place it along the side of the kayak with its free end pointing forward toward the bow; and thereupon pushing the end of the paddle sharply out to the side, and bending your body well forward toward the deck, you raise yourself by a strong circular sweep of the paddle. If you do not come right up, a second stroke may be necessary. A thorough kayak-man can also right himself without an oar by help of his throwing-stick, or even without it, by means of one arm. The height of accomplishment is reached when he does not even need to use the flat of his hand but can clench it; and to show that he really does so, I have seen a man take a stone in his clenched hand before capsizing and come up with it still in his grasp. . . . . A kayak-man who has entirely mastered the art of righting himself can defy almost any weather. If he is capsized he is on even keel again in a moment and can play like a seabird with the waves and cut right through them. If the sea is very heavy, he lays the broad side of his kayak to it, holds the paddle flat out on the windward side, pressing it against the deck, bends forward, and lets the wave roll over him; or else he throws himself on his side toward it, resting on his flat paddle, and rights himself again when it is passed. The prettiest feat of seamanship I have ever heard of is that to which some fishers, I am told, have recourse among overwhelming rollers. As the sea curls down over them they vol-

untarily capsize, receive it on the bottom of the kayak, and when it has passed right themselves again."

The coracle of the Mandans.

Very curious is the form of skin canoe called a "coracle." In use among ancient tribes of Great Britain, it was found among the Mandans of the Missouri district when Catlin visited them. It is circular, flat-bottomed, of no great size. Catlin says: "The old chief having learned that we were to cross the river gave directions to one of the women of his numerous household, who took upon her head the skin canoe (more familiarly called in this country the "bull boat"), made in the form of a large tub, of a buffalo skin stretched on a frame of willow boughs, which she carried to the water's edge, and, placing it in the water, made signs for us three to get in. When we were in and seated flat on its bottom, with scarce room in any way to dispose of our legs and our feet (as we sat necessarily facing each other), she stepped before the boat and pulling it along waded toward the deeper water, with her back toward us, carefully with her other hand attending to her dress, which seemed to be but a light slip and floating upon the surface, until the water was above her waist, when it was instantly drawn off over her head and thrown ashore; and she boldly plunged forward, swimming and drawing the boat with one hand, which she did with apparent ease."

Frame boats and ships.

A framework covered with bark or skin presents a pattern after which true framed boats might be produced; instead of sheets of bark or strips of skin one uses thin boards fitting neatly together, producing a result more firm and permanent though not as light. Such framed boats we use to-day as pleasure boats, propelled by oars; such boats excellently made were used long, long ago by bold seamen in Scandinavia. Some have been dug out of ancient bogs near Flensburg, where they have lain since the very beginning of the early Iron Age. Made larger, driven by wind, such boats be-

come sailboats; still larger and with full rigging we have ships and vessels; still later the power of steam, regular, mighty, completely in control, and ever ready when needed, supplants the irregular and fitful wind. From floating log to ocean steamer—such is the history of one development.

The raft and its development.

Instead of one log, several logs may be lashed together side by side; this makes a raft. Trimming the ends of the logs so as to make the whole raft pointed in front would be a step forward. Rafts may be poled along; they may be pushed by means of paddles or broad oars; they may bear sails, as among the old Peruvians; they may be buoyed with floats of skins or pottery, bladders, or the like, as in Egypt. Of course there are two purposes accomplished in building rafts. The object may be simply to transport timber; in such a case, of course, the more logs that can be used in the construction of the raft the better. The other purpose is to make a real means of transportation; in such a case the fewer the logs that come in contact with the water, the better. If the outer two logs of a raft alone are retained and held, separated but joined, by means of a bridge or platform which does not come in contact with the water, we have a marked improvement for means of navigation. This passes naturally and readily into the well-known outrigger canoe, or double canoe of the South Sea Islanders. The outrigger canoe consists of a canoe, driven by a sail, connected to a single log parallel to itself and at some distance from it. The double canoe consists of two canoes side by side and separated by some space, but connected. The catamaran is practically the same thing, and a Dover steamer is a catamaran driven by steam.

Propulsion.

Classifying boats as to their mode of propulsion we have, first, boats driven by a force upon the land; such force may be exerted as poling or hauling. The force may be applied to the water, as, in the simplest of all cases, where a man astride the

log paddles with his hands and feet; it may be applied by wooden paddles with one or two blades; it may be by means of oars held permanently at a middle point, or by oars and rudder; it may be by wheels at stern or sides; it may be by means of a propeller screw, single or twin. Again, the force may strike upon a sail or other objects raised above the vessel. The simplest form of wind-power applied to any craft is gained when a leafy bough is raised or when the body or the clothing is exposed; a very simple sail consists of a mat held by one or two sticks; masts with true sails come next; from thence we pass to booms and full riggings.

Form affected by kind of water, by purpose, and by power.

The form of boat is modified also by the nature of the water in which it is floated; boats vary with reference to whether they are for use in rivers, canals, lakes, or open seas. The use to which the craft is to be applied also affects its shape; boats for travel, war, trading, and sport will naturally differ. So, too, the mode of propulsion affects the form; rowboats, sailboats, steamboats, differ.

Quality of some primitive vessels.

The boats made by primitive folk are by no means to be despised. We have already mentioned a vessel of the early Iron Age from Scandinavia. It must have been truly seaworthy. Single log dug-outs of our Northwest coast are excellent and are capable of carrying war parties of from fifty to sixty men.[1] Some of the great canoes of Polynesia, made of well-finished boards sewed together with cords and daubed with pitch and other gums, carried great parties and were certainly serviceable for extensive journeys by water. In De Quatrafages' "Polynesians and Their Migrations," we may see how these populations have journeyed from island to island over an area more extensive than that of the whole continent of Asia.

Geographers among ruder peoples.

It is true that among many of the lower races of mankind men may live and die without ever having been more than a few miles from the place where they were born; it is also true

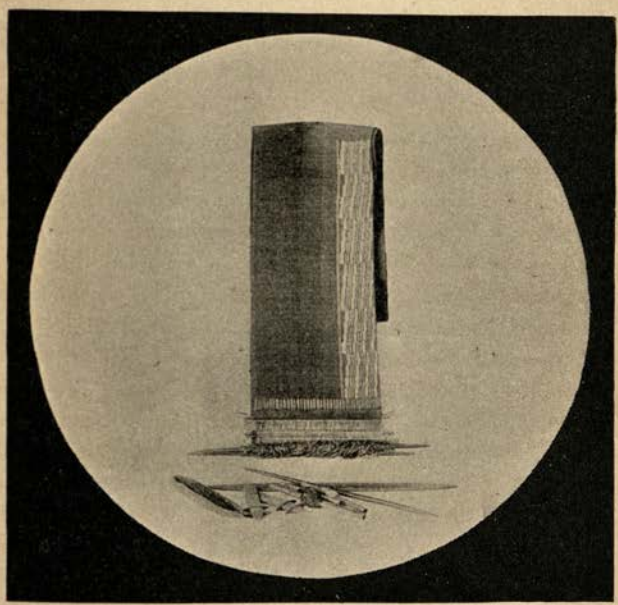

FIG. 21.—LOOM AND IMPLEMENTS USED IN MAKING BELTS, WITH UNFINISHED WORK. South Sea Islands.

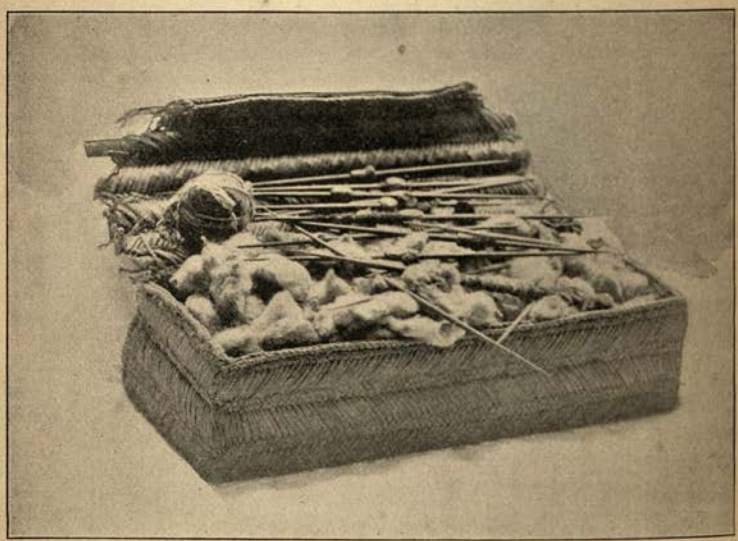

FIG. 22.—ANCIENT PERUVIAN WOMAN'S WORK-BASKET.

that among many populations we find a passion for travel and roving. The Eskimo are good geographers and have been known to sketch maps outlining a jagged sea-coast for a distance of a thousand miles or more with great accuracy. Some of the South Sea Islanders made ingenious sailing charts by taking thin splints or narrow strips of wood and fastening them together by means of cords or otherwise, putting shells at the crossings. The shells indicate the position of islands, while the splints in length and position show relatively the direction of one island from another and their distances apart.

Modes of land travel.

It would be equally interesting to trace the development of land travel; to notice what beasts have been used as carriers or draggers. Men, reindeer, llamas, camels, horses, elephants, all have been brought into use. A table might be prepared showing the development of carts and wagons and the transition of these into better and better vehicles up to the most magnificent of railroad coaches. We have not time or space for such discussion, but we must at least refer to the marvelous, though well known, use of dogs by Eskimo. Boas has fully described the sledges of the Central Eskimo. He says that the best model of sledge is made by the tribes of the Hudson Bay and Davis Strait, where there is abundant driftwood for the long runners. The runners are from five to fifteen feet in length, and from twenty inches to two feet six inches apart; they are connected by cords, bars of wood, or bone. The bottom of the runner is curved at front and cut off square behind; the runners are shod with whalebone, ivory, or the jawbone of the whale. In long sledges the shoeing is broadest near the head and narrowest behind, an arrangement adapted to use in soft snow. The shoe is either tied or riveted to the runner. The cross pieces at the top of the sledge project on either side and are notched for lashing loads. When the load has been placed upon the top of the sledge it is firmly fastened by means of a

The Eskimo dog sledge.

long cord which is passed back and over tightly above it. The dogs' traces are fastened to the sledge by a very stout thong. The harness, which is made of sealskin or bearskin, consists of two bights passing under the fore legs. They are tied by two straps, one passing over the neck and the other over the breast. The ends are tied together on the back, whence the trace runs to the sledge. The dogs are arranged in position with care, the strongest and most spirited being placed first, with the longest trace, which allows him to run a few feet ahead of the rest; next follow two or three strong dogs with traces of equal lengths; and lastly come the weaker and less manageable ones. The dogs must be accustomed to each other in order to pull well, and must know their leader. His authority is unlimited; he eats the choicest food; punishes the quarrelers in the pack by biting both, etc. There are variations in the making of these sledges; in Boothia frozen salmon are pressed into proper form for use as runners, and after being thus employed during the winter may be eaten in the spring. For the best results the shoe of the runner should be ice-coated. If the shoes are of good bone, ivory, or whalebone, the icing is done by the driver taking a mouthful of water and letting it run down the shoe until a layer one third of an inch thick is prepared; this is carefully smoothed with a snow-knife and polished with a mitten. Skin runners and others with poor shoes are first covered with a mixture of moss and water or clay and water; when frozen this is iced as above.

CHAPTER XVII.

GESTURE AND SPEECH.

ONE of the truly marvelous achievements of mankind has been the gaining expression for his thoughts. He solves the problem in various ways; he expresses thought by means of grimace, gesture, speech, and writing. In this chapter we shall consider the matter of gesture language.

How man has learned to express thought.

It has been claimed by many writers that tribes exist among whom it is impossible to convey thought from man to man after dark. The statement has frequently been contradicted, and it may not be true; but if there are such tribes, just what does it mean? Simply this, that gesture and the play of the expression upon the face is so full of meaning and so forceful that they greatly help in the conveyance of thought. Whether there are tribes whose members cannot talk together understandingly in the dark or not, it is certain that there are many tribes among whom gesture helps the spoken word exceedingly. Let us look for a little at this matter of gesture language. There have been a number of careful studies of the subject. Tylor devotes a most interesting portion of his "Early History of Mankind" to the subject; Colonel Mallery studied gesture language profoundly, and was particularly interested in the gesture language of our Indian tribes; Clark wrote a work of some value upon "Sign Language Among the Indians."

Importance of gesture.

The Anglo-Saxon prides himself upon his self-constraint; he does not wish to carry his heart upon his sleeve; he desires that his neighbor shall never know his inmost thought; from childhood he is carefully trained to say words with double meaning, and to be careful that his face does not betray his treach-

Where is natural gesture conspicuous?

ery. It is not in such a race or among such a people that we may hope to find much material for a study of natural gesture. It is among peoples who, like the French or Italians, speak in their every movement and whose faces show the thoughts that flit through their minds; it is among children, who have been untrained in duplicity; it is among the lower races—the true children of nature—that we must look for the best illustrations of our subject. Mantegazza could never have written his "Physiognomy and Expression" among the English; but in Italy, where the blood flows warm, and life is *lived* and *not suppressed*, where people breathe and laugh and act out their thoughts and express their emotions—there such a book could be produced.

Where study gesture language?

If we would study gesture language, pure and simple, at its best, we should visit a deaf-mute institution, or should travel among some lower barbarous people, or should attend the best of theaters. Every good actor must use gestures, and all his gestures must be those that are naturally expressive—not the stiff and awkward movements of the preacher in the pulpit.

Natural gestures are universally understood.

True gestures speak the same the world over, so that a native of Hawaii was taken to an American deaf-mute institution and began at once to talk in signs with the children, telling about the country he came from and about his voyage; that a Chinaman who had fallen into a state of melancholy from long want of society was quite revived by being taken to some place where he could talk in gestures to his heart's content; that a deaf and dumb boy named Collins was taken to see a "Lapland Village" on exhibition in London and that he thus wrote to his fellow-pupils: "Mr. Joseph Humphreys told me to speak to her by signs, and she understood me. When Cunningham was with me we asked Lapland woman and she frowned at me and him—she did not know that we were deaf and dumb, but afterwards she knew that we were deaf and

dumb, then she spoke to us about the reindeer and elks and smiled at us much." We have been told that when the delegates of Indians from strange tribes are sent to Washington, and no interpreter is by to translate their remarks, the students from the deaf-mute college are called in. They readily converse with these Indians of unknown language by means of gesture.

Natural gestures are of two kinds; they either point out an object thought of or they picture it in the air. It may not be lost time to give a few samples of sign language. On a certain occasion, when visiting the Sacs and Foxes, we met one of the old priests dragging a great string of ducks and chickens. Stopping him we pointed inquiringly to the poultry. Holding his hands before him, with the palms facing, he slowly moved his hands up and down, the movement being confined to the wrists. We knew as plainly as if he had said the words that there would be a dance. At once taking out our watch we opened it and held it before him; the old man knew our meaning, but he had no use for the white man's watch. Turning till he faced the south, he pointed with his right hand toward the eastern horizon, and then slowly raising his hand, stopped it when it had reached an angle of forty-five degrees. The sky is the Indian's dial-plate, the sun is the hand that marks the hours, and we knew that nine o'clock the next morning was the time for the dance to begin.

Kinds of gestures.

Samples of natural gestures.

Among the cases of gesture language described and figured by Mallery is a little story which he calls "Lean Wolf's Complaint." Lean Wolf was one of a delegation sent from a western tribe to Washington on business. Mallery was anxious to secure specimens of gesture language; the old chief was asked to give a sample. The story consists of but six gestures. The first—the right fist closed, with thumb extended, is lifted to the forehead and the thumb is drawn across it along a horizontal line; second—the two hands, held before the body at a distance

of about eighteen inches with the palms toward the chest, are slowly drawn horizontally toward the body; third—the right hand is extended before the body, open at about the level of the waist as if in greeting; fourth—the right hand is held vertically before the face at some distance, with the palm toward the face, the thumb bent inward, and the four upright fingers slightly separated; fifth—the right hand, folded except the first and second fingers, which are at first held parallel and together, is lifted to the lips; it is then swung outward from the lips and at the same time the two fingers are slightly separated; sixth—both hands are held at the same time a little before the chest, the fists clenched; they are then swung downward and outward and with some force until the arms hang at the sides. Such was the story of Lean Wolf. What was its meaning? The first four signs make a single sentence. White men wear hats; these come down along a horizontal line over the forehead; the first sign is used by all Indian tribes, meaning the white man. The second sign means "with us." The third indicates the shaking of hands, the making of peace, the swearing of friendship. Their naturalness will be easily seen. The fourth sign indicates time; it is the only one of the series which could be misunderstood; it, of course, means "four," but whether it is days, or weeks, or months, or years, might be in doubt; as a matter of fact, it means in this case four years. In other words, Lean Wolf says: "The white man made a treaty of peace with us four years ago." The fifth sign is a sentence in itself; brief, expressive, perfectly natural; it means, "He lied." It is very plain; it means he was two-tongued—that he said one thing and he meant another thing. It is a quality of the white man with which the Indian is quite familiar. The sixth gesture is also a complete sentence; it means, "I am done"; it means, "That is all—I have nothing more to say; we have had enough of the white man."

We have said that the theater was a good place to study gesture language; this is indeed true. Every real actor uses natural gestures. There was a time when pantomimes were more in vogue than now; they, of course, gave particularly good opportunity for gesture study. The theaters of lower races sometimes give us good examples. At the Chinese theaters we have seen the following bit of gesture: One player comes upon the stage swelling with importance; holding his right hand before him closed, but with the thumb held upward, he slightly waves it from side to side as he walks across the stage. (We scarcely needed that our Chinese friend sitting by our side should whisper, "See, he says, 'I am a great man.'") Just as the actor has walked once up and back across the stage a second actor comes upon the scene opposite to him; his manner is quite indescribable; half crouching forward, with a leer upon his face, he too raises his right hand before him, holding the little finger in the air and shaking it somewhat vigorously toward and at the great man, who is approaching him. Its meaning needs no translation for it says as plainly as words could say, "Oh, no, you are not a great man—you are little, insignificant."

Gesture syntax.

Tylor, in his valuable discussion upon gesture language, calls attention to the conventionalizing of natural signs, and to gesture syntax. The sign which at first was perfectly natural and self-evident may become in time conventionalized to that degree that its origin is quite lost from sight. We have already spoken of the Indian sign for white man; it is somewhat conventionalized. The sign for dog among the Plains tribe is to draw the first two fingers of the hand along the ground; at present this would have but little meaning; but when we remember that formerly the dog was a beast of burden and that he carried his load upon two poles, which, harnessed upon him, dragged along upon the ground behind him, its meaning be-

comes simple. The gesture language has a well-defined syntax which has been best studied among deaf-mutes. The deaf-mute strings together his words in an order quite unlike that in which we place them in our speech. He does not say "a black horse," but "horse black," not, "I am hungry give me bread," but, "Hungry me, bread give." Schmalz says, "What seems to him the most important he always states before the rest, what seems superfluous he leaves out." "My father gave me an apple," becomes, "Apple, father, I." The subject comes before the attribute; the object before the action; the modifier after the modified. He says for "I knitted," "Knitted I." To form a question he makes an assertion and then a look of inquiry. For "who" and "what" he looks about and points around in an inquiring manner, in fact makes a number of unsuccessful attempts to say "who," "what." "What is the matter with you?" would be, "You crying, you been beaten, you been hit?" and so on. "What did you have for dinner yesterday?" would be, "Did you have soup?" "Did you have porridge?" and so through the list. A conjunctive sentence he expresses by the alternative or contrast; "I should be punished if I were lazy and naughty," would be, "Lazy, naughty, no; lazy, naughty, I punished, yes." As an example of cause and effect; to make the statement a man died of drink he would say, "Died drink, drink, drink." If he were asked, "Did he die today?" he would put the case beyond doubt by saying, "Yes, he drink, drink, and drink." "To make" is too abstract an idea for a deaf-mute. To show that a tailor makes a coat or a carpenter makes a table he would represent the tailor sewing the coat and the carpenter sawing the table. To say "Rain makes the land fruitful," would be, "Rain falls, plants grow."

These examples and quotations must suffice. In the works referred to very much material of interest will be found.*

*See Appendix.

CHAPTER XVIII.

GESTURE AND SPEECH (*Continued*).

Man's first speaking.

WE HAVE seen how naturally gesture and grimace express thought. We may be sure, however, that man from the earliest time also made use of sounds for expression. It would be very interesting to know what the first language spoken by the human race was like; it is in some degree possible to guess at it and to reconstruct it.

Imitation of sounds.

It seems to be a natural thing for man to imitate the sounds he hears about him. Thus we frequently find that animals or birds have been named by savage and barbarous people after the noise which they produce. Thus, on one occasion, when securing words among the Sacs and Foxes, the author was talking with old Sam Bear at his *wikiup* on the bluff; the old man had been giving word after word in his language; finally he said,

Onomatopes.

"You know all the different kinds of birds?"

"No, Sam, *wickano* is bird, but the different kinds of birds I not know."

"White man, one kind of bird *kaw kaw*. You know that kind?"

"Oh, yes, I know that kind of bird; big black bird, isn't it?"

"Yes, big black bird—what kind white man call him?"

"Crow."

"Yes, white man call him clow, Indian man call him *kaw kaw*."

The old man then went on to speak of the *pono-ponu* who went all night—making the noise. This is very common. Many of the Indian tribes on this continent, and almost all wild

peoples everywhere, name birds and beasts from their cries. In the same way, objects made by man which when in use produce a noise are likely to be named from the noise they give forth. Thus among these same Indians a very common word is *shishikwun*. It means a rattle and consists of two parts. The termination *kwun* is used to indicate an instrument used for some definite purpose. The *shishikwun* then would be an instrument which goes "shi shi"; the noise is very like that produced by the rattle, which consists of a hollow gourd containing dry seeds or pebbles.

Children imitate natural sounds.

We all know that children are prone to speak in such words. They speak of "bow-wows" and "miaus" quite naturally. It is true that this practice on the part of the child is much encouraged by the mother or nurse, but it is also frequently original with the little one. Words which have been produced by repeating or imitating natural noises have been called onomatopes. We shall call them imitative words.

Such words, once adopted, change.

After the imitative word has once been made, it is very easy for it to be adopted into the language and every-day life and changed or applied to new uses. Thus Tylor tells us that the word "toucan," which is the name of a bird, was first given to the bird on account of its cry; but the toucan has an extremely large beak, and a certain tribe of Indians in South America which are characterized by their large noses have been named the Tucanos.* We see here the imitative word taken over into language and turned to a new use. In the same way, the old sound word "pipa," or peep, which was the name of a musical instrument, a tube which cried "peep" when blown upon, has been taken up into language and applied to all hollow tubes or pipes. The word which begins as an imitative sound word may become so changed and altered in its form that its origin

* It is interesting to note that thieves' slang shows the same metaphor in thought here—in it the nose is "the beak."

is completely lost from sight. There is also a constant tendency to change words to make them agree with sounds. "It is very curious that we should find the same tendency both at the beginning and at the end of the history of word-making."

Cry words, or interjections.

It is probable that there were many imitative sound words in the first language of mankind; there were also many interjections and exclamations. Animals express their emotions by means of cries, and man must surely have done the same. The interjection, or exclamation expressive of emotion, is the natural accompaniment of grimace and gesture. Of the Greenlanders Crantz says: "The women, particularly, accompany many words with meaning glances, and he who does not well comprehend this may easily miss the sense. Thus, when they confirm anything with pleasure they suck down air through the throat with a certain sound, and when they deny anything with horror or contempt they turn the nose and give a slight noise through it." Tylor speaks of certain cries which he calls "voice gestures," thus, "m-m-m-m" evidently means incapable of speech, and it occurs both in the "mu mu" of the West Africans and in our own word "mum." The gesture sound of blowing is frequently used to indicate contempt and disgust, as "pah," "bah," "pooh"; this is self-expressive. The gesture sound of spitting, "tut-tut," has given rise in English and in Dutch to "tut" and in Tahitian to the verb "tutua." These words so crude and simple—mere outcries, expressing glad or sad feelings, or conditions—must have formed a considerable part of the primitive language of man. They are more frequent and more expressive in languages of lower peoples than in our own; in the Chinese there are many, and in the languages of barbarous and savage peoples there is a still larger proportion. Such cry words may be taken up into language, combined with other words or changed in such a way as to become truly unrecognizable.

Most words are built up on *roots*.

But if we look at the poorest language we can find we shall not discover that it is composed entirely, or even in large part, of these two elements. What we really find in any language is that the *bulk* of the words are neither onomatopes nor cries, but words built up on what the linguist calls roots. These are definite. Take such a language as the Sanskrit, Hebrew, or Chinese with their many thousands of words, set aside the few natural words, and the rest are all traceable to a few hundred simple sounds called roots, which by treatment of one kind or another are able to give rise to these hosts. Max Müller says there are less than 2,000 in Sanskrit (1706), only 500 in Hebrew, and still fewer in Chinese (450). Yet this last boasts 40,000 to 50,000 words. Whitney says:

Few in any language.

What is a root?

"The analogue of the *root* is the stick or the stone, indubitably man's first instrument; a crude tool or weapon, used for a variety of purposes to which we now adapt a corresponding variety of much more intricate and shapely tools. . . In each root at the outset was present a whole assertion, or inquiry, or command, to which the tone and accompanying gesture, or the mere circumstances of its utterance furnished the sufficient interpretation; just as in the stick or stone was present, *and may on an emergency be made present still*, a variety of instruments or weapons."

Examples.

Examples from our own family of languages are most easily comprehended by us, and among the roots of our old Aryan ancestors the following having been fruitful: *gna*—knowing, *sad*—sitting, *ga*—going, *i*—going, *ma*—measuring, *da*—giving, *vid*—seeing, *rag*—ruling, *mar*—dying. These were originally neither noun, nor verb, nor adjective, but all at once. We cannot better show their use than by quoting Whitney's illustration:

The character of roots.

"'Bow-wow' is a type of the whole genus '*root*.' It is a sign, a hint that calls before the properly prepared mind a certain

conception or set of related conceptions; the animal itself, the act, the time, and other circumstances of hearing it and what followed. It does not mean any one of these exclusively. It comprehends them all. It is not a verb, for that adds the idea of predication; nor is it a name. It may be *used* as both. What it comes nearest to meaning in itself is 'the action of barking'—just that form of abstraction into which we now most properly and naturally cast the sense of 'a root.'"

The origin of roots.

Whence came these roots? Were they a gift to man? Or was there that in his nature which led to a spontaneous selection of these as sounds *fitted* to express a certain idea? Or were they derived from older sound words, from interjections, and from the meaningless babble of children and the speech experiments of grown men? We must answer that we do not know—we may never know. If we may occasionally seem to find the origin of a "root," it is suggestive that the latter is the true hypothesis. Could we find many such origins we might develop a demonstration.

Sir John Lubbock's investigation.

Sir John Lubbock has conducted an investigation upon the words for "father" and "mother" throughout the world. Several interesting facts are shown by his tables, viz.: that the words for father and mother are the easiest sounds which a child can make; that the roots "pa" and "ma" are interchangeable and applied outside of these relationships—from which he concludes that the words are natural baby words, and that the Sanskrit root "pa," to protect, comes from *pa*=father and *not vice versâ*, as generally supposed by philologists. *If* the case is made out—and we find a "root" of such importance to be a derivative from a baby word, or natural sound—other "roots" may have originated as naturally.

Such, at all events, was the beginning of language—imitatives, cries, and roots, with the aid of gesture and grimace.

CHAPTER XIX.

GESTURE AND SPEECH (*Continued*).

Devices for increasing range and power of languages.

THE tool is made; it remains to increase its efficiency. The problem may be thus stated: Given a few words, onomatopes, interjections, and roots of vague application and uncertain use, to make from them a language of broader range and capable of expressing the most delicate shades of meaning. The problem has been worked out by different people in many different ways; we refer to but a few.

Intonation.

(*a*) *Intonation.* The nations of Southeastern Asia by a change of tone give to the same sound a different meaning. Thus, Tylor cites from the Siamese:

há = to seek.
hā = pestilence.
hà = fine.

Among the Chinese this intonation is most complicated. At Canton there are eight tones for words. These are arranged in an upper and lower series of four each. At Peking there are four, at Nanking five, and at Swatow seven. The four tones are called "ping," "shang," "kiis," and "jih"—or, the even, the ascending, departing, and entering tone. Each has its appropriate use. Approximate ideas of each may be gained by the following examples of "shing":

(1) "When I asked him, '*Will you let me see it?*' (*a*) he said: '*No, I'll do no such thing*'" (*b*). *a*, upper; *b*, lower, even tone.

(2) "*Ah! indeed!*" the ascending tone. Like crescendo in music.

(3) Drawling tone of repressed discontent, grumbling, and

eking out a reply is not unlike the departing tone. Somewhat like diminuendo.

(4) Entering tone—and abrupt ending, in same modulation as even tone, but as if broken off; as if a man about to say "lock" is taken with a hiccough in the middle so as to leave off the last one or two letters.

The example is quoted from Williams' "Middle Kingdom." Of course intonation presents great difficulty to missionaries and almost hopeless obstacles to adapting Chinese or Siamese words to our tunes. Williams illustrates the confusion wrong intonation may cause by advising the reading of the following sentence, accenting it as marked: "The présent of that objéct occasioned such a transpórt as to ábstract my mind from all around."

(*b*) *Change in root vowel.* We ourselves use this. Thus we change the tense of verbs and out of "meet" make "met"; we produce plurals in the same way and from "man" get "men." The method is one of wide use. Some African tribes, as the Mpongwe, make negatives thus: the expression *mitonda* means, "I love," but the expression *mitōnda* means, "I do not love." Change in root vowel.

(*c*) *Reduplication* is a device much used and in various ways. It is very common to make plurals by reduplicating a part of the word or the whole word. Thus, in the East Indies *raya* is "a prince," *raya raya* is "princes," *orang* is "a man," *orang orang* is "men" or "people." Some of the tribes of our Northwest coast, such for example as the Tsimshians, make plurals by reduplication. Every one remembers that the Greeks used this device for making the aorist of verbs. A famous German linguist, Pott, has written an entire treatise on the subject of reduplication in language. Reduplication.

(*d*) By far the most simple and common method of increasing the range of a language has been by adding old words Combining old words.

together in order to make new words—the device may be called compounding. It is not necessary to give a long list of examples; they may be found in every language. It is interesting to study Indian languages in order to see the way in which words have been coined to name the objects and actions brought in by the white man. Of course, however, it is not only recent words which show the device in question. Thus, in the language of the Sacs and Foxes, the word *kicus* means "sun," the word *tepek* means "night," and the word *tepekicus* means the "night sun" or the "moon." Among the same people the word *conia* is "silver"; the important part of the word "yellow" is *sâ* and the word *sâ-conia* means "gold"—"yellow silver." Dr. Edgerton Young tells us that among the Northern Crees there are new words for our words "book," "letter," and "envelope." Apparently the book was first named; at all events, the word for letter means "little book"; the word for envelope is a combination which means literally "little book shirt." In other words, it is something drawn on over and covering the little book.

Making of new words among Indians.

It is not our object to trace further the course of linguistic growth, development of parts of speech, inflection, and grammar. Interesting as such a study would be, we must leave it to the professional linguist. What we have endeavored to show is that language has been an invention and a development; that man's thoughts were originally communicated by gesture and grimace and by imitative and ejaculatory words; that from these small beginnings, by such devices as intonation, word coloration, doubling, and combining, he had increased his store until, dropping the aid of gesture and grimace, he can express clearly, fully, and easily every thought and desire.

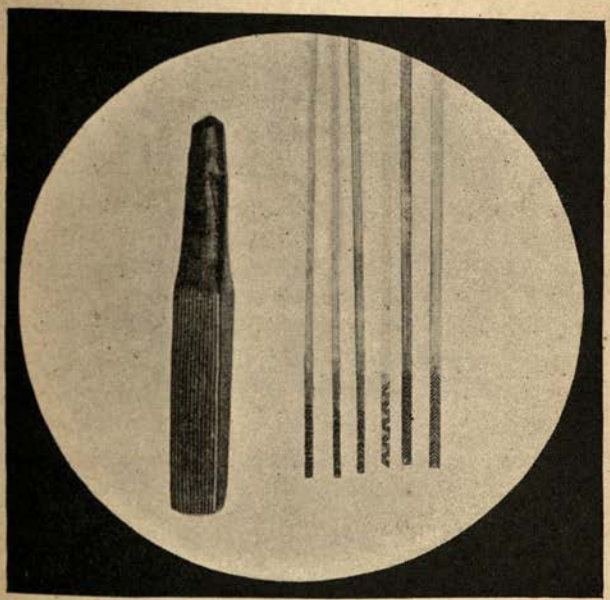

FIG. 23.—BEATER AND STAMPS USED IN MAKING TAPA.

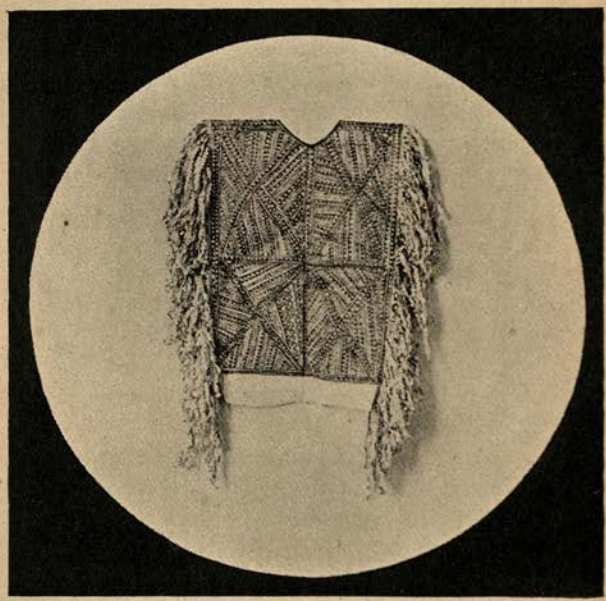

FIG. 24.—GARMENT OF TAPA. South Sea Islands.

CHAPTER XX.

Gesture and Speech; Ethnic Peculiarities.

One of the most interesting things in the study of language is the marked way in which peculiarities and differences in the mental character of tribes are shown. The languages which we meet with to-day have grown up independently. Populations severed from others, who had spoken the same tongue in the beginning, have changed and varied the language which they used in common, until it has assumed new and peculiar characteristics. These ethnic peculiarities show themselves in many different ways. We shall cite a few of these ways as examples.

Ethnic differences are shown in language.

(*a*) Certain tribes dislike or are unable to pronounce certain sounds. A very old illustration of this is found in the Bible; it will be remembered that on one occasion the Hebrews tested those whom they feared with the word "shibboleth"; the fact that these were unable to say more than "sibboleth" betrayed them. If we look over the languages of the whole world we find perhaps some three or four hundred simple sounds. Any one people uses only a small part of these; we ourselves have less than fifty. Some of the sounds which we have and which seem to us perfectly natural are not to be found in some other languages and cannot be pronounced by some peoples. For instance, it would be very hard to find a German who could pronounce the word "Thistlethwaite." When at school we learned that *l*, *n*, and *r* were letters of the same kind. We found it hard to believe and could see no similarity among them; but to-day we are perfectly convinced of their likeness. When visiting the Sacs and Foxes we were frequently asked

Differences in *phonology*;

whether we had come that day from "Cedal Lapids," or from "Cedan Napids," but never whether we had come from Cedar Rapids; among these people the *l* and *n* are absolutely interchangeable and the *r* does not occur. A man among them would ask for a loan of "half a donnal," or "half a dollan," but he could not have said "half a dollar" if the loan had depended upon his doing so. Still more remarkable was the fact that much of the time, when writing down words from their pronunciation, it was impossible to say whether they used an *l* or an *n*. In some languages we find such strange sounds as the clicks of the Hottentots, the hiatus of some Northwest coast tribes, and the curious "tl" in combination as an initial or final. The latter is common among the Tlingits of Alaska and the Aztecs of Mexico. We have ourselves borrowed some words from the Aztec language in which the "tl" occurred; for example "chocolotl" and "tomatl"; the fact that we have changed these into "chocolate" and "tomato" shows how unnatural the combination appears to us.

In accent;

Whitney, who has discussed this matter of ethnic peculiarities in languages, calls attention to the second one, (*b*) peculiarity in accent of words; thus the Greek word ἐπίσκοπος figures, in modified forms, in English, French, Portuguese, Danish. It is plain on comparing the forms that these peoples present curious differences in the way in which they have accented the word. The French throw the accent toward the end of their words; the Germans place it in the earlier part.

In character of roots;

(*c*) A third way in which ethnic peculiarities show themselves is in the character of roots. The roots of Aryan words are monosyllabic but may be made up in various ways; Semitic roots, on the contrary, are all built on one plan, and are characterized by a tri-literal, consonantal structure. Whitney states that the Malayo-Polynesian family of languages shows a strong prevalence of dissyllabic roots.

(*d*) Languages also vary greatly in the matter of grammatical agreement and control. The stock example always cited is the Turkish. In Turkish there are two kinds of vowels, sharp and flat. When a verb contains a sharp vowel in its radical part, the vowels in all the other elements of the word must be made sharp in order to agree with it. *Sĕv* is the root of the word "love," while *bäk* is the root of the verb "regard"; the infinitive termination has the initial sound of *m* and a final sound of *k* and, when it is attached to *sĕv*, must contain the sharp *ĕ* to agree with the vowel of the root, but when it is attached to *bäk* it must contain an *ä* for agreement; hence the infinitives are *sĕvmĕk* and *bäkmäk*. Similarly the plural termination varies to agree with the root. Thus *ĕvlĕr* means "houses" and *atlar* means "horses." There are also interesting examples of a sort of control to be found in Polynesian languages.

In grammatical control.

Language has not only been a tool of man; it has reacted upon him. The question is sometimes discussed whether words or thoughts were first. It is a question suited to a debating society of a country schoolhouse but can scarcely be considered worthy of serious discussion. The word is an expression of thought; as such the thought must come first; but it is certain that the thought could not long exist without expression. Thought and expression were born almost simultaneously and they have ever gone on increasing in clearness, exactness, and range together. As the thoughts were clearly expressed the power of thinking developed; but as the range of thought increased the expression also increased. Probably every one has a fringe of thought lying just outside of his ability of expression, but it is certain that the latter can never be far behind.

Reaction of language upon man's intellectual powers.

To the anthropologist, who is seldom or never a linguist, language is interesting, (*a*) in determining connection or contact between different races, (*b*) as showing the status of a race

Why languages interest the anthropologist.

or people, (*c*) as evidence of a grand development and progress.

(*a*) Comparison of languages shows community of origin or contact.

By comparing languages from different parts of the world we learn much of the relationship between widely separated people. The resemblance between two languages may be so complete and so exact that it can be explained only by believing that the two peoples speaking them have come from a common ancestry; or it may be of such a kind as to suggest that the ancestors of the two now separated peoples have, some time in the past, been in contact and have permanently influenced one another. In arriving at any conclusion as to origin or contact from a study of language there are certain words which we must leave out of sight; similarity in cry words, or in imitative words, teaches nothing as to community of origin. Nor is it sufficient to find a few words alike in the two languages; the resemblances should be many and between words which are used for expressing the commonest thoughts and for naming the commonest objects. We must expect also to find *similarity* between words, and not *identity;* it is not probable that two separated people, who began by speaking the same language, should preserve the pronunciation exactly; in time changes would creep in and ultimately the words would vary. The tracing of relationship between different Indo-European tongues and the reconstruction of an Aryan tongue, which no man has ever heard and of which there are no written remnants, is one of the triumphs of modern science.

(*b*) Study of a language gives much information as to the status of the people using it.

Were a people to be blotted out of existence, but their language preserved and interpreted by students long after, it would be possible, from the study of the language alone, to fairly reconstruct the every-day life and the status of the tribe. This is what has been done in large part for the ancient Aryans. Sometime or other, somewhere or other, in Europe or Asia, there existed a population—progressive, enterprising, vigorous —who permanently influenced all the peoples with whom they

came into contact. Its language we have just stated no longer exists, but it can be—yes, it has been—reconstructed. From it we know what the old Aryans were like. "They were agricultural nomads. They knew the arts of plowing, making roads, building ships, weaving and sewing, erecting houses; they counted up to at least one hundred; they had domesticated the more important animals—the sheep, the cow, horse, dog; they were acquainted with the more useful metals, and were armed with iron hatchets whether for peace or for war. They had recognized the bonds of blood and bonds of marriage. They followed their leaders and kings, and the distinction between right and wrong was fixed by custom and by law. They were impressed with the idea of a divine being, whom they invoked under various names." So much Max Müller and others have taught us. Keary says: "There are hardly any terms connected with farming, whereas they are redolent of the herd, the cattle fold, the herdsman, the milking time. Even the word daughter means, in the lost language, 'the milker.'"

(*c*) Study of languages evidences a mighty mental progress.

Nothing shows so plainly as language the enormous progress which man has made in mental operations. Among many series of words or terms which would illustrate this none are more suggestive than those used for counting. It is possibly true that there are some peoples who have so poorly defined ideas of number that they can scarcely count. Thus the Puris and the Botocudos of South America have three words for number; they are "one," "two," and "many." The poor fellows' minds become confused in dealing with numbers above two. The Tasmanian has four words, "one," "two," "plenty," and "five." Think for a moment of the condition of men who cannot count beyond two, and imagine the pleasure of trading with such. Suppose the native, with such a numerical outfit and mind, has agreed

Numerals.

to trade bananas against bits of tobacco at the rate of two bananas for one bit of tobacco; having ten bits of tobacco we desire to secure twenty bananas; we push the ten pieces of tobacco toward the native and draw over the twenty bananas. He is not satisfied, but with a look of helpless despair takes back his property and returns ours. Then placing two bananas over he takes one bit of tobacco; a second pair of bananas are passed over and a second piece of tobacco taken, and so on, until he has all the tobacco and we all the bananas.

Counting on fingers and toes.

The words used in counting by many people show us that formerly a great number of tribes were in exactly the same position that those mentioned are at present. More than that, they show us in many cases how primitive man in counting kept his mind from wandering. It is certain that the first mental operations in numbers were helped out by the fingers. Thus, there is a tribe on the Northwest coast which has distinct words for one and two; surely for a long time their ancestors had no ideas of higher numbers. The words for three and four are combined words and are really as follows: "two-one," "two-two." The word for five is the word for hand. The word for ten is two hands. The word for fifteen is foot and the word for twenty is man. It is certain that at first these people only counted two; that gradually, with the help of their fingers to keep them straight, they got on by one-two and two-two to ideas of three and four, and to five—the hand. Then, of course, the other hand and the toes were brought into requisition until at last number words were gained to twenty.

Scores of interesting cases of this hand-counting have been gathered by various writers, and occasionally we may even find the operation going on before our eyes. Tylor, who has particularly studied the subject, quotes Father Gumilla as follows: "They say, 'Give me one pair of scissors,' and forth-

with raise one finger; 'Give me two,' and at once they raise two, and so on. They would never say five without showing a hand; never ten without holding out both; never twenty without adding up the fingers placed beside the toes. The mode of showing the numbers with the fingers differs in each nation. The Qtomacs to say three unite the thumb, one finger, and middle finger, keeping the others down; the Tomanacs show the little finger, the ring-finger, and the middle finger, and close the other two; the Maipores raise the fourth, middle, and ring-fingers, keeping the others hidden."

We have said that language evidenced a great mental development and progress. Does it not? There is a profound distance between the man who scarcely has clear notions of numbers beyond two, and who with difficulty works out his mathematics on his fingers and his toes, and the astronomer who weighs the earth in balances and calculates the distances of the sun and stars.

CHAPTER XXI.

WRITING.

The problem presented.

WHEN we look at the written or printed page we seldom realize that millions of men through thousands of years have labored to answer the question, "How can we perpetuate our ideas of to-day that the coming men may know them?" That was the problem. It has been answered by several peoples. We shall trace the development of writing among three different populations: the American Indian, the Chinese, and the ancient Egyptian. We do not at all mean that the three developments themselves are related, although we shall find that each of these peoples has solved the problem in practically the same way.

North American Indians.

First, then, as to the North American Indian; he has learned to write.

Material helps to memory.

Before all writing there comes a stage through which man makes use of material objects to serve as reminders—mnemonic helps. How natural this is, we ourselves recognize by tying a knot in the corner of a handkerchief or fastening a bit of string about the finger, when we fear lest we shall forget something. It is said that some of the eastern Algonkin Indians used to keep a record of the important events in the tribal history by means of holes dug in the ground. At times an old man to whom the history of the tribe was well known, and to whom each hole was familiar, would take the boys out along the trail and tell them the meaning of each hole. It is probable that the Sacs and Foxes have as sacred objects what they call

micams, which are described as being simple boxes in which are a variety of curious objects each of which has associated with it a fact or passage in the tribal history and ritual. At the religious festivals the old priest takes from the *micam* one object after another and holding it before the people says, "This object from the sacred *micam* is to remind us of the time when Wisuka was here and taught us what we should do." Each object is connected with some portion of the teaching of Wisuka, and by the aid of these material reminders the legendary law of the tribe is carried on from generation to generation. Among the Iroquois belts of shell beads were used on public occasions, as treaties and the like. The wampum of which these belts were composed was either white or purple and the beads were so managed as to produce patterns or designs on the belt; with each figure some detail of the treaty would be associated or some point in their history would be connected. The keepers of the wampum belts knew the ideas thus connected with the beads. A last sample of such reminders may be mentioned; the *quippus* of the old Peruvians. These were knotted cords of different colors. The knots varied in size and character and indicated different orders of numerals. By means of such knotted cords, census lists and various records of a mathematical kind were kept. These reminders are not true writing, but they are the first attempt to solve the problem presented.

Pictures as means to carry on a thought.

The drawing of pictures is a natural and early method of representing the thought to be remembered. Among the Dakota Indians it is a common thing for chiefs and old men to have picture records of their lives. Several sheets of legal-cap paper will be pasted together at the edges to form a strip and upon this strip the man makes his autobiography in pictures. Here one may see a representation of the first war party that the owner went upon; next may be a picture showing when he

(*a*) Whole pictures.

first stole ponies; again, one may see pictured out the occasion when he, as a delegate from his tribe, went to interview the Great Father at Washington. Such a record we may look upon almost as a written history; it is the carrying on of a thought by means of pictures.

(*b*) Part pictures.

But to draw the pictures fully demands time, patience, and some degree of skill. It would be an advantage to economize all three and instead of drawing complete pictures to draw part pictures which should suggest the whole. Thus a man who had been upon a war party and had killed four men and cut their throats might represent the incident by a drawing in which each detail should be shown. He might, however, just as well draw four heads with necks attached and indicate that they were cut by drawing a line across the necks. Such a man would have made an important step forward in the direction of true writing.

(*c*) Symbols.

But there are many things which are not easily represented directly either by the whole picture or part picture. Such may, however, be brought before the mind by a picture which in some way or other serves to call up the object or the thought without really representing it. Such a picture may be called a symbol. If you visit the Pueblo of Zuñi, and buy from some old woman pottery, among the pieces there may be a low broad dish for carrying sacred meal for use in dances. Upon this dish there may be represented several black objects like the figure here shown (Fig. A). On asking the meaning of this figure —for in pottery made by Pueblo women, for their own use, most designs have meanings—you may learn that the dish is used in summer, and that the pictures painted on it suggest summer. The way in which this figure comes to mean summer is fairly simple; during that season the pools of water in this arid region swarm with tad-

FIG. A.

poles, which are really the things represented. So abundant are they that the sight of the picture naturally calls up the thought of summer.

Pictures, part pictures, and symbols—these are the elements with which the Indian writes; by them a considerable range of thought may be expressed. Two samples of North American picture-writing will illustrate this fact. The first one has been presented many times and is no doubt familiar to most readers. When Schoolcraft journeyed across the head waters of the Mississippi, he noticed on a certain morning as they were breaking camp an Indian who was marking rude designs upon a bit of birch bark. When the artist had completed his task he took a slender pole, split it at one end, stuck it in the ground slant-

Picture-writing employs all three.

Samples: Schoolcraft's birch-bark letter;

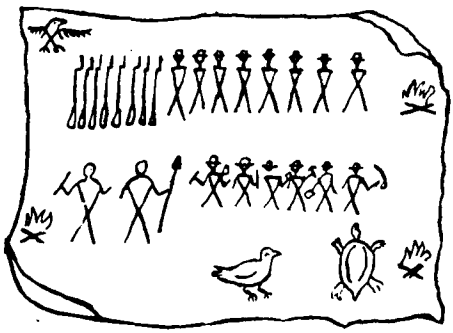

FIG. B.

wise, cut three notches on it, and inserted the bit of birch bark in the split end of the stick. When questioned he replied that he had written a letter which any Ojibwa Indian would understand about their party. This letter is here reproduced (Fig. B). That the party was a government party, or "eagle people," was shown by the bird in the upper corner; that the party consisted of eight soldiers, white men, each with his gun, was

shown by the figures wearing hats and with the guns near by; that there were six officers or specialists connected with the party was shown by six similar figures—the captain carrying his sword, the book-keeper his book, the geologist his hammer, and so for each of the others, their trade or position was indicated by some object carried. Two Indian guides were with the party and were represented without hats; that each of the three classes camped by themselves at night was indicated by the three little camp-fires drawn; the officers the night before ate the only fresh meat that was in the camp, a turtle and a prairie chicken, both of which were shown. The direction in which the pole slanted showed the direction of the journey, and the three notches cut in the pole showed that the intention was to go three days in that direction. It will be seen by examining the letter with some care that this method was not only simple but efficient.

Mallery's Dakota calendar.

Something over one hundred years ago a man among the Sioux determined to keep a record of the years as they passed. One incident only was to represent each year. A buffalo skin was prepared and pictures representing the idea of each year were drawn or painted in black or red as the years passed. In time copies of this first record were made and scattered through the tribes. The earlier symbols are practically alike in all, but in the later ones each individual who had made a copy and kept a record might use his judgment as to what design should represent a given year. In the original record the pictures were arranged in a spiral line and one was added every year at the outer end of the line. Lieutenant Mallery has made a special study of these Dakota calendars, or winter counts. A few samples of the figures used are here appended. In 1800 there was a rudely drawn outline of a human figure, done in black and spotted irregularly with red blotches; during that year smallpox prevailed and many died. For 1813 we have a sim-

liar rude outline with lines slightly diverging from before the face; in that year whooping cough was frequent and fatal. In 1840 there was a treaty of peace, and two hands are shown extended toward each other. In 1851 the Sioux first received blankets from the government, and the design shows a blanket with representatives of the tribe sitting around it (Fig. C).

But it was in Mexico that picture-writing gained its fullest development among North American Indians. The Aztecs had a perfect system, with which they wrote many books. Unfortunately the vandalism of the early Spanish priests destroyed most of these books, and very few samples of their picture-writing are left. The books they had were painted on good paper, which was made from vegetable fiber beaten out. The long strips were folded back and forth, much as a screen is folded. The colors used in painting were frequently vivid and retain even to the present much of their freshness. The books dealt largely with religious festivals and the legendary history of the people. Most of this old Mexican writing is real picture-writing such as we have discussed. Here and there, however, there appear samples of characters of a different kind.

Pictography of Aztecs.

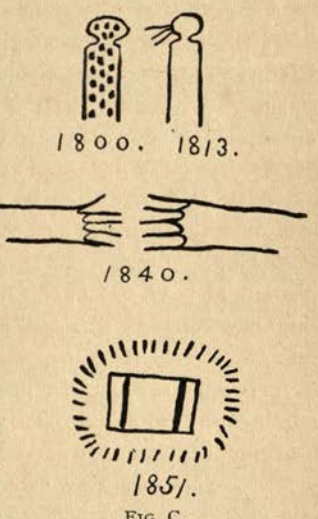

FIG. C.

At this point it is necessary that we shall introduce two words: an *ideogram* is a character which represents an idea; a *phonogram* is a character which represents a sound. In picture-writing, or pictography, ideograms are used. In our

Definitions of *ideogram* and *phonogram*.

own writing we have phonograms, and each phonogram re-
sents a simple element of sound.

In the Mexican picture-writing the name of an old chief
Itzcoatl, occurs repeatedly. It is gener
written by means of an ideogram (Fig.
consisting of two parts, a serpent and a
of knives upon its back. Itzcoatl m
knife-snake; and the character is sin
picture-writing, should be read as a pict

FIG. D.

and gives by ideas the man's name. But at times a n
which we may be sure is Itzcoatl is written in a different
(Fig. E). This character consists of three parts; if we
these parts as pictures we shall get
words, knife, basin, water. But there
no such chieftain among the Aztecs, and
as before stated there is reason to beli
the name intended is Itzcoatl. We m
then, not read this character as an id

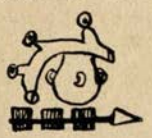

FIG. E.

gram. Can we read it as a phonogram? Knife is
basin is *co* (*mitl*) in which the important part is *co*; wate
atl. If instead of taking these elements as being pictures
resenting ideas we take them as characters representing sou
we shall get instead of *knife, basin, water*, the word *Itzco*
In other words, the Mexicans, while they had a marvelously
veloped picture-writing were beginning to think of letting ch
acters stand not for ideas but for sounds. They were go
from ideograms to phonograms.

The most advanced native people of North America, p
haps, were the Mayas. They had an ancient picture-writi
many of their characters became conventionalized and some
them, at least, were beginning to be not pictures, but sou
characters.

So much, then, for the North American Indian. Beginni

with material reminders he had passed through drawing pictures and part pictures and symbols to a complete pictographic system. In places he was thinking of using characters to represent not thoughts, but sounds.

The Chinese, etc.

Our second line of writing development is that of the Chinese. They began just where the North American Indian began. There was, no doubt, at one time a large use of various kinds of material reminders among them. Very early, however, the Chinese began to write by means of pictures. Thus, Tylor gives a cut in which a series of these ancient pictures is shown. The sun consists of a circle with a dot in it; the moon is represented by a crescent; a mountain is shown by three peaks upon a horizontal line; a tree is a rudely drawn representation of a straight trunk with branches going upwards and roots going downwards; the word for dog is very distinctly a side view of a creature of that kind. Besides these, mouth, eye, and many other words are represented by the simplest kind of pictures. Several hundred of these pictures were devised, giving a considerable range of expression. Upon certain ancient seals and other carved work these old characters, true pictures, may be found and easily recognized. These still last in the written language of to-day, but have been so altered that it is only when we place the modern form side by side with the old one that we can recognize its original picture character.

Pictures.

Combinations of pictures.

To increase his range of expression the Chinaman combined his rude pictures in various ways, and many of these combinations are exceedingly ingenious and interesting. Thus the word for dawn is a picture of the sun just above the horizontal line; the word for bright consists of the old pictures of the sun and moon set side by side; the character for words is the numeral four and the character for mouth. The character for sincere is an interesting one; the Chinese are generally thought to be a race of liars; it can hardly be that, when their written

language was developing, they were such. The writte
acter which means sincere consists of two parts, one c
meaning man and the other words. A people whose bes
sentation for absolute integrity would be a man's wor
scarcely be a race of liars. Very pretty is the word fo
ful, which consists also of two parts. We asked a
friend on one occasion how this word came to mean b
what was the significance of its two parts. Pointing to
he said, "Some little child, may be my little girl"; poi
the second, "Some baby, may be my little boy, little ch
A people which can think of no better way of conve
thought of beauty than by using the words for little ch
not an unsentimental race. With his pictures and comb
of pictures the Chinaman was able to represent a fai
range of thought.

It was natural that in time he should give the cl
which had long been a picture—an ideogram—the val
sound. The Chinese language is full of homophonous
Homophonous words are words which sound alike bu
different meanings. Tylor cites as an example of a
phonous word in English the sound "box." Box may
receptacle in which things may be placed; it may mean
of a coach, a blow upon the ear, a little evergreen used
gardens for hedges, a tree which yields fine-grained wo
rulers, or to name in order the cardinal points of the co
Suppose, now, that we were developing a written langua
means of pictures; suppose we had one character whic
the picture of a box; suppose we wished to speak of
upon the ear. It would not be unnatural for us to take th
picture and let it stand for the sound and not for the idea
resented by the picture. When we had done this we sh
have turned an ideogram into a phonogram; we should
passed from pictography into true writing. This the Chi

Transfer of ideograms to represent sounds.

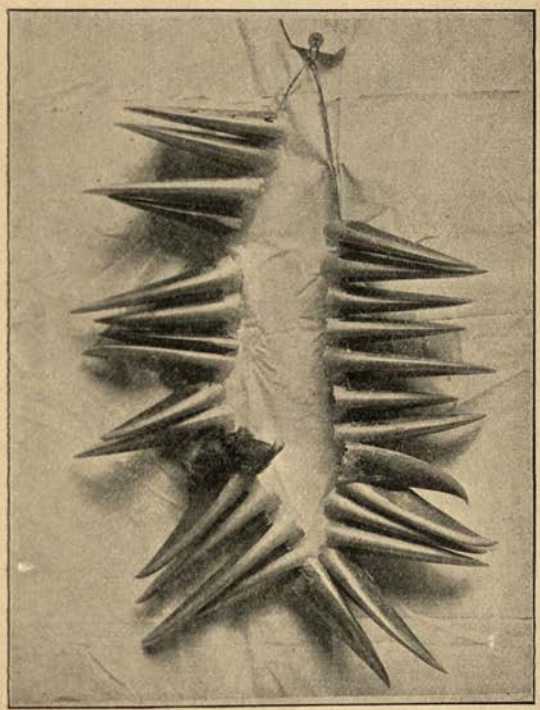

FIG. 25.—NECKLACE OF TOUCAN BEAKS. South America.

. When supplied with ideograms they began to use their pictures to represent not ideas, but sounds. But we have stated that his language is full of homophones; when he had taken his picture and let it stand for a sound, it was not easy always to know which meaning of the sound was to be taken. The consequence was that the Chinese were driven to put a second character alongside of the phonogram in order to determine which meaning was to be taken. Such a second helping character is called a determinative. So the Chinaman developed written language. He began with drawing rude pictures; he combined the pictures variously to form characters for abstract terms; his ideograms began to be used for sound characters; his sound characters being uncertain, on account of the genius of the language, he was obliged to make them definite by means of determinatives. The Chinese language to-day is written by perhaps forty thousand characters, each of which represents a word. Some of these characters are simple pictures; some are combined pictures; some are simple phonograms; some are combined characters, consisting of a phonogram to give the sound and a determinative to define the meaning.

Determinatives.

The Chinese were originators—great inventors. They are people of strong mental power. There was a people in Eastern Asia which had no well-developed, written language. Their language was totally unlike the Chinese, being composed of words of many syllables, not of monosyllabic words. Never inventing anything, they borrowed everything. They deserve this much of credit, that they have always improved what they borrowed. Of course, the people here referred to are the Japanese; a race which, compared with the Chinese, must be pronounced decidedly inferior. Naturally they desired to borrow writing from the Chinese. It will be seen, however, that the task was monstrous; forty thousand words to be learned! The

The Japanese borrowed Chinese characters.

Japanese selected a certain number of old Chinese characters and gave them new and definite force with reference to their own language. Each character thus borrowed was a phonogram and represented a syllable. Two series of these characters are used among the Japanese; the one called "Iroha" consists of some forty-eight, the other called "Katakana" consists of two hundred and sixteen characters. Notice these phonograms are all phonograms with syllabic values. It is, however, also true that many ideograms and other real Chinese phonograms are still retained in Japanese writing.

The result.

The Egyptian began just where the North American Indian and the Chinese did. There is no doubt that he made use of material reminders, and it is certain that he early developed a system of pictography. We have a considerable amount of his picture-writing remaining in the well-known hieroglyphics. His first pictures were as simple and crude as those of which we have already spoken. Thus, the characters for sun, star, water, are the simplest of pictures. Just as the Chinese, the Egyptian combined his simple pictures in order to express abstract or complex ideas. Thus, for battle we have two arms and hands, one of which grasps the shield, the other the spear; for night we have a star under cover; for thirst we have a calf prancing toward water. Just as the Chinese ancient pictures became broken down into simpler and easier forms in writing, just so the old picture-writing of the Egyptian became simplified, and the hieratic and demotic writings of later times, while related to the hieroglyphics, seldom carry their picture origin plainly in sight. In time the characters which had been simply ideograms came to be used to represent sounds. The Egyptian language was like the Chinese in being full of homophonous words. This difficulty in the way of using phonograms was obviated in exactly the same way as among the Chinese; determinatives were introdued and written along-

The Egyptians.

The progress as among the Chinese and Japanese.

side the phonograms. Many of the characters in the later Egyptian writings were composed thus of two parts, one of which gave the sound while the other determined its meaning.

There was one other operation which took place in Egyptian writing which must not be forgotten; the phonogram, which at first stood for a word, gradually came to be used not for the whole word, but for its initial sound. This process of using a character to represent the initial sound of its first meaning is called *acrology*. The Egyptian, then, began with reminders and pictures; he developed combinations of pictures, complex ideograms; he made these ideograms stand for sounds—whole words; he found himself obliged to attach determinatives to these sound characters; he finally used some of these characters for almost simple sounds instead of for words. If he could have disposed of all except these simplest characters he would have completely solved the problem. Unfortunately he could not rid himself of the past, and in the latter days of ancient Egypt there was great confusion in writing; simple ideograms, word phonograms, broken-down phonograms, representing almost elementary sounds—all were used at once. Acrology.

There were about thirty characters which had been developed for representing simple, almost elementary sounds. There was in ancient times a population who were to the Egyptians what the Japanese were to the Chinese. The Phœnicians borrowed writing from the Egyptians; they borrowed, however, not the whole cumbrous system, but took the simple phonograms, which the Egyptians had produced by acrology from their word phonograms. These, written in the simplest way and retaining little of their old picture value, made the first alphabet. The Phœnicians were the traders of the Mediterranean; they carried their new acquisition everywhere—to Cyprus, to Greece, to Rome. Once, Taylor tells us, there was in the old Egyptian picture-writing a character which meant owl. It was a simple An ancient borrowing people. The first alphabet.

picture of the bird itself. But the word for owl was *mu*, and in time the character which at first was probably an ideogram meaning an owl came to be used as a phonogram equivalent to *mu*. Still later, by acrology, the character was used for the sound m^u. In the latter history of Egyptian writing, when one came upon this character, which by that time had been much reduced in its writing, he was never sure whether its meaning was "an owl," the sound *mu*, or the sound m^u. This character the Phœnicians borrowed with the meaning m^u. From them the Greeks and Latins gained it; from them we have it; whenever, then, we see a capital letter M we may well remember that it is all that is left of the old Egyptian picture of an owl.

Our letters go back in some cases to Egyptian pictures.

The history of the other letters of our alphabet is not so easily traced, but on the whole we may say that the origin of our letters in the old Egyptian pictures is fairly proved. It may help in closing to place in tabular form the steps in the development and to indicate how far each of the three peoples whom we have considered has carried the progress. Reminders, pictures, combination pictures, word phonograms, syllable phonograms, letter phonograms—these are the stages. The North American began with reminders, developed a very perfect picture-writing consisting of pictures, part pictures, and symbols. He was just beginning to think of phonograms. The Chinese began with reminders, developed a system of picture-writing, and passed into word phonograms. The Japanese, going one step further, write by means of sound characters, each of which represents a syllable. It is the third development only which has been carried to the end; the Egyptian began with reminders and pictures, and passed through phonograms almost to letters; the Phœnician starting from his vantage ground, borrowed and improved, and gained an alphabet. It is interesting to notice how similarly the human mind works in places far remote from each other. Given the same problem and simi-

lar surroundings and we shall find much the same result.

TABLE SHOWING THE STAGES OF THE DEVELOPMENT OF WRITING AMONG THREE GROUPS OF PEOPLES.

		North American Indian.	*Chinese, Japanese.*	*Egyptian, Phœnician.*	Table.
REMINDERS.					
IDEOGRAMS.	Pictures, . . .				
	Part pictures, .				
	Symbols. . . .				
PHONOGRAMS	Words, ...				
	Syllables, ...				
	Letters				

CHAPTER XXII.

TALES AND TRADITIONS.

The "Uncle Remus" stories.

SOME years ago a book was issued by an enterprising American publisher under the name of "Uncle Remus." It was filled with stories told in negro dialect dealing with various animals as heroes. The publisher announced the book as a humorous work, but it is doubtful whether Mr. Harris, who prepared the manuscript, intended the book should be considered simply such. The stories, at least many of them, are old. They were not made up by Joel Chandler Harris, but are true negro stories told by the fireside in the South; nor is it probable that many of them arose in America. They go back, most of them, to Africa, and, in the first place, they were not told as tales to children but as real things talked of among the men. In these stories the animals think and talk and act like human beings. The wild creatures are all called "brer"—or brother; thus, there is "Old Brer Wolf," "Brer Fox," "Brer Rabbit," "Brer Tarrapin." Creatures who on account of size and fierceness are entitled to respect and domestic animals are honored by the name of "Mister"; thus, there is "Mr. Horse," "Mr. Lion," and "Miss Cow." In the "Uncle Remus" stories the animals have friendships and partnerships; on the other hand, they also have life-long animosities and hatred. Brer Rabbit and Brer Tarrapin can usually be counted on to help each other out; between Brer Rabbit and Brer Wolf or Brer Fox the deepest animosity exists. On the whole, old Brer Rabbit is the best man among all the critters; he is little, he is not strong, he is

comparatively harmless in reality, but in the long run he may generally be expected to come out ahead. Curious things these "Uncle Remus" stories. If we could really understand them in all their bearings, we should know much of primitive and savage man's philosophy.

What is a myth? There are two factors in the creation of a myth. There are two qualities of the savage mind with reference to nature, which give birth to them. These qualities are: first, a tendency to personify everything, and, second, a desire to explain all things. No one has so fully and so simply discussed the origin of myths as Tylor in his "Early History of Mankind" and in his "Primitive Culture." We can do no better than to summarize his masterly treatment. Everything in nature is personified. The fire is the hungry beast, licking with its red tongue the food. The sun and moon are personified. In a certain Malay story the moon is a woman, so is the sun. The moon's children are the stars; the sun once had as many. On a certain occasion the two mothers agreed to devour their children, and it was settled that the moon should do so first. Instead she concealed them in darkness and then called the sun's attention to the fact that she had performed her part of the contract. Thereupon the sun devoured hers in good faith. When the moon withdrew the darkness and the sun realized that she was duped she started in pursuit of the moon—a pursuit which is still kept up; from time to time the pursuer overtakes the other and bites a piece out of her. So the waters and the rain clouds, the winds and storms, the dew of the evening, day and night, are all personified, living and thinking, working and playing, hating and loving, just as human beings do.

Nature myths; how produced?

Two factors.

Personification.

Sample nature myth, to show tendency to personification.

Animals in particular are constantly personified by ruder peoples. It is not easy for us fully to realize early man's idea of animals. Brinton says: "As a hunter, primitive man was always matched against the wild creatures of the woods, so superior

Primitive man's conception of animals.

to him in their dumb certainty of instinct, their swift motion, their muscular force, and their sufficient clothing. Their ways were guided by a wit beyond his divination, and they gained a living with little toil or trouble. They did not mind the darkness, so terrible to him, but through the night called one to another in a tongue whose meaning he could not fathom, but which, he doubted not, was as full of meaning as his own. He did not recognize in himself those godlike qualities, destined to endow him with the royalty of the world, while, far more clearly than we do, he saw the sly and strange faculties of his antagonists. They were to him, therefore, not inferiors, but equals—even superiors. With such notions of animals, it is not at all strange that we should have such stories as we find in "Uncle Remus." Very natural, too, among such people, is the belief in the transformation of men into animals and of animals into men, and throughout much of savage Africa we find it to prevail.

Stories showing effort to explain facts of observation.

But besides personifying all things about him, our primitive man tried to explain everything. Any unusual thing in nature must have a reason; any curious point about an animal must have a cause. We have already seen in the preceding story from Malaysia an illustration of this tendency; the story is an effort to explain why there are no stars in the daytime and what eclipses are. It is very common to find the ruder peoples of the world explaining peculiar features in certain kinds of animals by a story. Thus, the North American Indian answers the question as to why the mole is blind: It seems that once the mole was large, with good eyes, and living on the earth as other creatures do. In those days the sun was erratic and irregular; sometimes the days were far too short for the animals to accomplish all their labors and at other times the sun staid up so long that all became greatly wearied. After council the animals agreed to catch the sun and make him promise to be

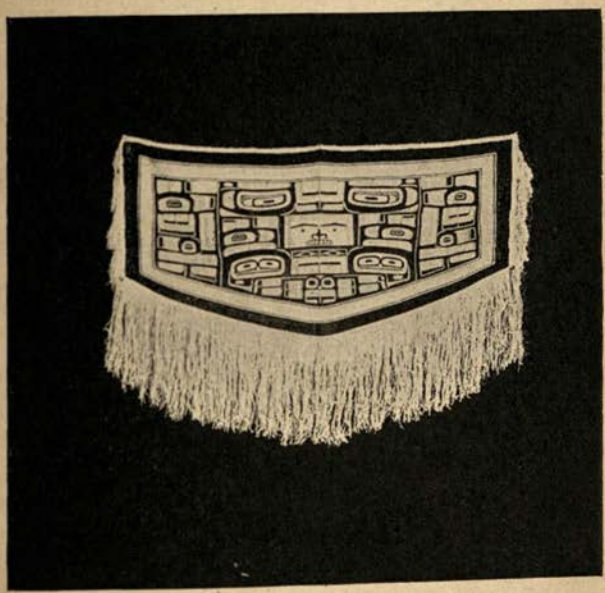

FIG. 26.—CEREMONIAL BLANKET. Chilcat Indians, Alaska.

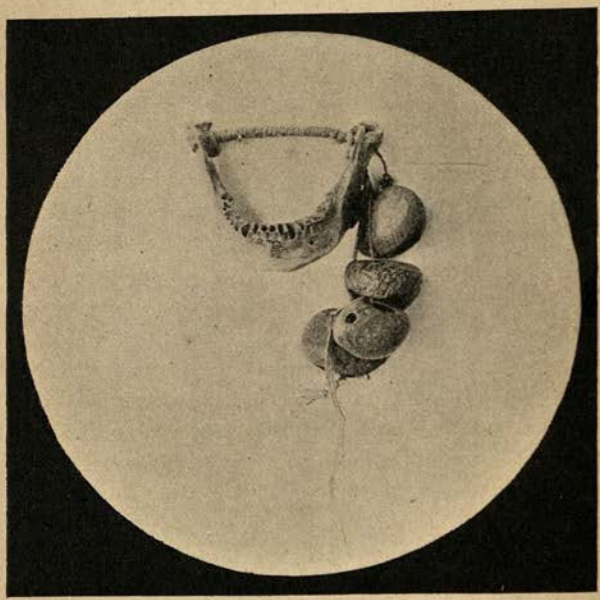

FIG. 27.—ARMLET WORN IN DANCES. New Guinea.

more regular. The plan succeeded. The question then arose how to loose the prisoner. Various animals made the attempt, meeting with disaster. Finally the mole volunteered his services and shrewdly dug a burrow underground, appearing at the surface where the cords were fastened and gnawed them through, loosing the captive. But even he paid a penalty. The heat of the sun shriveled him to his present size, blinded his eyes, and scorched his teeth. Ever since the ground mole has burrowed underground, and has been blind, and has had orange-brown incisor teeth. Another story illustrating this same tendency is found in Central America. Two chieftains were clearing the ground for crops; each day they did their work, each following morning they found the fields overgrown. Watching, they found that animals, at night, called the weeds into existence. The next night they watched, prepared to avenge themselves. The animals, after having done their damage, started down the trail to the water; the princes, standing one on each side, reached out for them. Several passed unharmed. At last the rabbit and the deer went by; in those days both of these animals were characterized by great bushy tails; caught by these, in their struggle to escape their caudal appendages were torn out, and ever since both deer and rabbit have had no tail. No more were caught until the rat passed by; this poor creature they captured and squeezed his head between two sticks and rasped his tail; and ever since the rat's eyes look like black beads, and as if they would pop from his head, while his tail has never any hair.

Stories grow and change.

This latter story is an interesting case, illustrating this second tendency—to explain things observed. The rapid growth of noxious vegetation in fresh-cleared fields, on the one hand, and the peculiarities in various animals, on the other, had to be explained. With these two elements given, personification and explanation, we have material for

any quantity of nature myths. Hundreds of them have grown up in various parts of the world, but in all cases they illustrate these two tendencies. But stories, once created, do not stand still; like words, they change, become compounded, assume new meaning, fixing themselves in new surroundings. Cox names as aids to mythic change *polyonomy, equivocation, localization, love of a miracle,* and *desire to point a moral.* One or two of these only shall we discuss. Polyonomy, the use of different names to designate the same hero, leads to confusion and the development of several stories out of a single primitive tale. "A thousand figures would be used to describe the action of the beneficent or consuming sun, of the gentle or awful night, of the playful or furious wind; and every word or phrase became the germ of a new story as soon as the mind lost its hold upon the original force of the name." The same simple story told of the sun among an ancient people, in which he figures in one instance as the bright one, in another as the rapid racer, in another as the ardent or glowing one, might grow into three stories of as many different heroes. By equivocation, Cox means that words which have similar sounds may be confused and give a different meaning to the portion of the story in which they occur. As an illustration he suggests that the idea of poisoned arrows used by Achilles may have been wrought out of a reference to the purple rays of the sun; the Greek word *ἰος* meaning violet as well as poison, while the word meaning rays might easily be mistaken for the word for spears or darts.

Aids to mythic change.

Polyonomy.

Equivocation.

There is a constant tendency ever at work in all stories to fit them to the surroundings in which the narrator finds himself. This is localization. A few years since, in southern California, we had the pleasure of getting certain boy friends who live there to tell us some of the dear stories of the olden time which are found in Grimm's "Household Tales"; but the stories

Localization.

as told us by the boys in southern California were never just as Grimm or any other German author could have told them. They invariably had local coloring, and in them bee ranches and other peculiarly southern Californian ideas figured. Who ever heard of bee ranches in Germany? But if a story is to live in a new home it must be changed to suit surroundings. The stories told among most American Indians are always definitely connected with the landscape near at hand; such an incident occurred in such a mountain, and such another was connected with a certain river. Yet it is quite certain that, in many cases, the story told was fully developed and worked out long before the tribe came into its present home or amid its present surroundings. A story starting in one district and traveling far may come to be so changed and altered that it is well-nigh unrecognizable.

The nature myth developed.

A simple nature myth may be developed, then, into a greatly detailed story, into a saint legend, or into an epic poem. The same story may be dressed out in a dozen forms and represented, over and over again, as if distinct narratives of different incidents and heroes.

Study of myths.

There has been of recent years great interest shown among scientific men in the study of these old stories. The pioneers in the field were no doubt the great Germans, the brothers Grimm. The idea that old tales told at the fireside, by aged women to little children, might contain material worth serious study took the world quite by surprise. As Max Müller says: "It might seem strange indeed that so great a scholar as Grimm should have spent so much of his precious time in collecting his *Mährchen* if these *Mährchen* had been only made for the amusement of children. When we see a Lyell or an Owen picking up pretty shells or stones, we may be sure that, however much little girls may admire these pretty things, this was not the object which these wise collectors had in view. Like

the green and blue and rosy sands which the children play with in the Isle of Wight, these tales of the people, which Grimm was first to discover and collect, are the detritus of many an ancient stratum of thought and language buried deep in the past. They have scientific interest."

Results of study:

Since the days of Grimm there have been many busy workers. Max Müller, Theal, Dasent, Cox, and a host of others have gathered folk tales in many districts and studied them with care. It is true that much careless and hasty work has been done; it is true that many astonishing and untenable results have been reached; but it is also true that *much* of solid value has been gained. Among these results a few may be mentioned. First, man's mental progress has been traced. It is a great distance from the simple, crude story, such as the savage makes to explain why the deer has no tail, to a mighty epic like the Iliad.

(*a*) Progress shown.

(*b*) Community of origin, or contact, proved.

Second, community of origin of widely separated tribes has been demonstrated, or contact in times beyond our historic knowledge has been shown. Two stories remarkably alike are found in different districts. It is natural to assume that the two peoples among whom we find them must have come either from a common stock or from ancestors who at some time have come in contact. In investigating such stories with the idea of proving community of origin or contact in the past we must apply certain criteria. (*a*) The stories must be very much alike and the similarity must extend to minute details. (*b*) The stories must be of such a character that they could not as simple nature myths arise independently. Let us look at two pairs of stories which seem to resemble each other more or less and apply these tests.

Criteria.

Examples.

"Mink and the Sun."

The first is a story found among some Indians of our Northwest coast by Boas. It is the story of the "Mink and the Sun." Mink was a boy or animal, or both perhaps. He was

playing grace-hoops with the ducks and beat them. Then they petulantly began to tease him; called him names and said, "You do not even know where your father is." This was true, though it had never caused the boy any particular thought before. He hastened to his mother. She told him that his father carried the sun every day and lived up in the sky. His uncle then made the boy a bow and arrows and directed him how to shoot with them. The first arrow stuck in the sky; the second caught in the notch of the first, and so on, until finally a chain of arrows reaching from the sky to earth had been constructed, up which the boy climbed. He found his father and, the next day, was allowed to carry the sun in his stead. All went well until he got to the top of the hill. Then getting uneasy and restless, he started down at a great pace, kicking the clouds out of his way as he descended. His father's attention was called to the destruction he was causing to the earth by his antics; the trees were shriveling, the grass was parched, creatures were suffering. Snatching the sun from the boy, the father hurled him from the sky.

Compared with the story of Phaëton, and with "Jack and the Beanstalk."

Of course, every one recognizes at once that this story of Mink resembles two different stories which we all know. The first part recalls "Jack and the Beanstalk"; the second part is very much like the Greek story of Phaëton and Phœbus. Must we conclude that the Northwest coast Indian is descended from the same people as the Greeks or Germans? Not at all. The stories, while they are alike and thus satisfy the first criterion, are such as might readily arise independently in two districts. To the savage the sky seems firm and solid; the sun is either a living being or is carried by a person; the sun itself must have got up there sometime or the person carrying it must have done so. What more natural than that some other person should also ascend to the sky, and who more naturally than a descendant of the one already there? On the other hand, what

would be more natural in any district where dreadful droughts parched the fields, shriveled the leaves, and dried up the grass, than the belief that something ailed the sun, that it was carried perhaps by a new and inexperienced carrier, and, if so, who would more naturally be thought of as that carrier than the son of the usual bearer? In other words, there is nothing in these stories except what is suggested by natural occurrences.

The story of the dog and the sparrow.

The other pair of stories at first appear less alike than these. Cox has made the comparison. The German story of the dog and the sparrow tells how a carter drives over a dog which the sparrow had saved from starvation. The angered bird predicts the loss of the cart and the horse. The carter scorns her. As he drives up a hill the bird pulls the bung out of the barrel and lets the wine which he was carrying spill. He is enraged at the loss, but the bird cries, "Not enough, carter." As he drives down a hill she picks out the eyes of one horse. To kill her the carter takes up a hatchet and hurls it at her, but, missing, kills the horse; the same thing happens with his other horses. Reaching home he finds a host of birds destroying his grain standing in the field. He bemoans his loss, but the bird cries out, "Still not enough; it shall cost you your life." The bird then flies into the house and the carter darts after her. Striking at her he breaks his window-frames, and later, his furniture, but at last when he has caught the bird he says to his wife, "She shall die most horribly, for I shall eat her alive." Fluttering up into his throat as he attempts to swallow her, the carter screams to his wife, who with an axe aims a blow at the escaping bird, but, missing it, kills her husband.

Compared with that of the Nautch girl and parrot.

The other story is from India. A Nautch girl tries to extort money from a poor woodcutter by a false breach of promise suit. The judge is aided in his decision against the dancing girl by a wise parrot, which belongs to a rich merchant. The furious girl threatens him, saying, "When in my power I will

bite off your head." The parrot retorts, "I will live to make you a beggar. Your house shall by your own orders be laid even with the ground and for very rage you shall kill yourself." The girl dances at a dinner given by the merchant, pleases the audience, and demands the parrot as her reward. She orders his head grilled. The cook plucks the bird alive, and, turning to get water, the bird escapes. In terror the cook replaces it by another bird. The parrot, going to the temple, hides behind an idol, the favorite god of the dancing girl. This girl is superstitious and much afraid of death, and has ever prayed that she might not die. The next day she appears at the temple and a miracle happens; the idol speaks in answer to her prayer. In response to its commands the woman goes to her home, sells all she has, and gives it to the poor; she sets free her slaves; she levels her house to the ground. In one week she returns to the temple, in order that she may be translated. A great retinue, almost the whole town, is present to see the miracle, and then the bird creeps out from behind the idol. In the rage which seizes on the woman when she finds herself beggared and betrayed, she dashes out her brains against the stone floor of the temple.

It may seem as if these stories were by no means so similar as the other pair which we have considered, but if we strip them of their details we find that in their framework they are plainly the same. In both cases there is a friendship between a bird and some honest, harmless creature; in both cases a more powerful person attempts to do harm to the bird's friend and the bird predicts misfortune in detail, to property and life. In both stories the bird itself is the chief agent in bringing about the punishment. In both, again, the wicked actor in the story attempts to injure the bird by eating it, head and all. A story of this kind could hardly arise independently in two different parts of the world. It must be that, sometime

or other in the distant past, a very simple story was often told with just these elements. In the centuries which have gone by this simple story has developed in detail, has assumed local coloring, adapting itself in one case to German surroundings and in the other to Indian. But such a story may be safely held to show community of origin or contact in past time.

(*c*) Supplies a check to much apparent history.

And, lastly (*c*), the study of myths, their origin and growth, enables us to apply a check to much that appears to be good history. William Tell is not the only hero of a people whom it has proved to have never existed as a real man, but to have grown up out of some story suggested by nature and by early man's surroundings.

CHAPTER XXIII.

MARRIAGE AND FAMILY.

Two interesting questions present themselves with reference to woman: first, what has woman been in society; second, what has she done?

Woman, her position and achievement.

Before we approach either of these questions it may be well to emphasize two striking characteristics of woman. First: Woman excels in her appreciation of and strife after beauty; she seems instinctively to apprehend and love the beautiful sooner than man. It is a question whether the beautiful is an actual, abstract something inherent in beautiful things or whether it is something which we have constructed for ourselves as an ideal. If it is the former, the ideal should be invariable; if the latter, it might vary with peoples and individuals. The ideal of feminine beauty is certainly exceedingly variable. Thus, old Hearne tells us that the Chippeway ideal of beauty in the woman demanded "a broad flat face, small eyes, high cheek-bones, three or four broad black lines across each cheek, a low forehead, a large broad chin, clumsy hooked nose, and breasts hanging down to the belt." It is natural that women should strive to increase their natural attractiveness by artificial methods; the same remark might be made regarding men. The modifications are often found in the direction of the natural race characteristics. The Mongolian foot is naturally small; the African nose is low and wide. The means used vary greatly and can be only briefly suggested; they are more fully discussed in a preceding chapter.

Two striking characteristics:

(1) Keen appreciation of and strife after the beautiful.

The teeth may be sharpened or blackened; the hair may be dyed; the head shaped; the body tattooed. In Java the women blacken their teeth and look with horror on the teeth of whites; "like dogs' teeth." In the Orient women color, with henna, their nails, hands, neck, and hair. In the Song of Solomon we read of "purple hair."

(2) Extreme of tender love.

The other eminently feminine characteristic to which we refer is maternal love and tenderness. There are no tribes so low in the scale of humanity but that the mother loves the child with a marked degree of tenderness. The monumental work of Ploss contains abundant evidences. Thus, he speaks of a mother living along the Mosquito Coast who sings by her dead child the following song:

"Dear little one, I go far from thee!
When will we meet again and go together on the shore?
I feel the kiss of the sweet sea air upon my cheek;
I hear the distant roaring of the sad thunder;
I see the dazzling lightning flash upon the mountain cliff,
Which enlightens everything. However, thou are not by me.
My heart is burdened and full of sorrow.
Farewell, dear little one, without thee I am comfortless."

He quotes also, from Powers, a description of an old Indian woman in California who had loved a little half-breed friend who had died. She sprang to the grave and bowing over it cried: "My poor little one, farewell! Ah, thou hast a long way before thee to the Spirit land and must go alone. No one from us can accompany thee. Listen, now, carefully, to what I say, and believe surely that I speak the truth. In the Spirit land there are two paths. One is the rose path, which leads to the land in the west, far over the great water; yonder thou wilt find thy mother. The other is thick grown with thorns and thistles, and leads into the dark land, which is full of snakes. Here you would forever wander and never come to rest. Go to the rose path, little one, hear now, which leads thee to the beautiful land in the west, where eternal summer prevails. May the

great Karaya help thee that thou mayst come to thy goal, for thy little feet must go alone. Farewell, darling little one!"

We call attention to these two points in woman's character simply to show that, anywhere and everywhere, woman is the same. Whether the Australian savage or the belle in a civilized community, she shows alike an attractive and amusing personal vanity and a tenderness quite unlike that of men.

Woman is everywhere the same.

Almost everywhere the woman is to some degree oppressed and kept in subjection. The worst condition, perhaps, is found in Australia. Lubbock states that their condition in the island continent is wretched in the extreme. Treated with the utmost brutality, they are beaten and speared on the least provocation. "Few women," says Eyre, "would be found to be free from frightful scars upon the head or the marks of spears upon their bodies. I have seen a young woman who from the number of these marks appeared to have been almost riddled with these spear-marks. If at all good looking their position is, if possible, even worse than otherwise." In China the classics speak of woman's three obeyings: first, before marriage to her father; second, after marriage to her husband; third, in widowhood to her sons. Even if not maltreated they are often not respected. While Patagonian women are not abused, it would be considered disgraceful for a husband to help his wife at work. Among the negroes of Caillé, Baba, when asked why he did not make merry with his wives, replied, that if he did he should not be able to manage them for they would laugh at him when he ordered them to do anything. Among some Mohammedans women are considered to be without souls; in many places they are debarred religious services. Among certain African and California tribes are regular secret societies whose only purpose is to keep the women in ignorance and subjection.

Usually she is more or less in subjection.

Women are often the subjects of peculiar and extreme pro-

Subject to peculiar prohibitions.

hibitions. These may affect their food, language, or decorum. Hottentots, ancient Mexicans, Todas, do not allow women to eat with nor before men. Among some people they are forbidden certain kinds of food, and there are distinctly marked kinds of men's food and women's food. Thus, in Tahiti, the woman may not eat the same kinds of food as her husband, nor in the same place, nor cooked at the same fire. Men could eat frogs, fish, fowls, cocoanuts, plantains, and offerings to the gods; women could eat none of these on pain of death. Women could not touch the men's fire or their food basket under the penalty of death. So Ellis tells us. Among the Khonds women may not eat pork. Among the Mishmis they eat no animals but birds, fish, and field mice; nor may a woman eat food in her father-in-law's house. These prohibitions are sometimes directed against the mode of woman's appearance or her freedom of going from place to place. Thus, among the ancient Mexicans, women might not appear in public; Mohammedan women generally are not allowed to go without veils in public. Prohibition against seeing articles used in religious ceremonial is known. Thus, we are told that among the Uaupes, the musical instruments used at the festivals were not to be seen by women; when the sound of these instruments is heard approaching, every woman repairs to the woods or sheds and remains invisible until after the ceremony is over. The death penalty is inflicted for neglect of this prohibition.

Prohibitions with relation to parents-in-law, etc.

Some of the most singular prohibitions are produced by marriage; such are widespread and relate to address or conduct with parents-in-law. Thus Franklin says that "among the far northern Indians it was considered extremely improper for the mother-in-law to speak or even to look at her son-in law; and when she has a communication to make to him it is etiquette that she shall turn her back on him and address him through

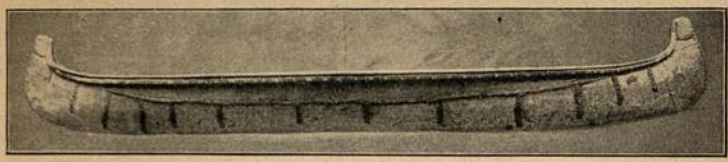

FIG. 28.—OJIBWA BIRCH-BARK CANOE.

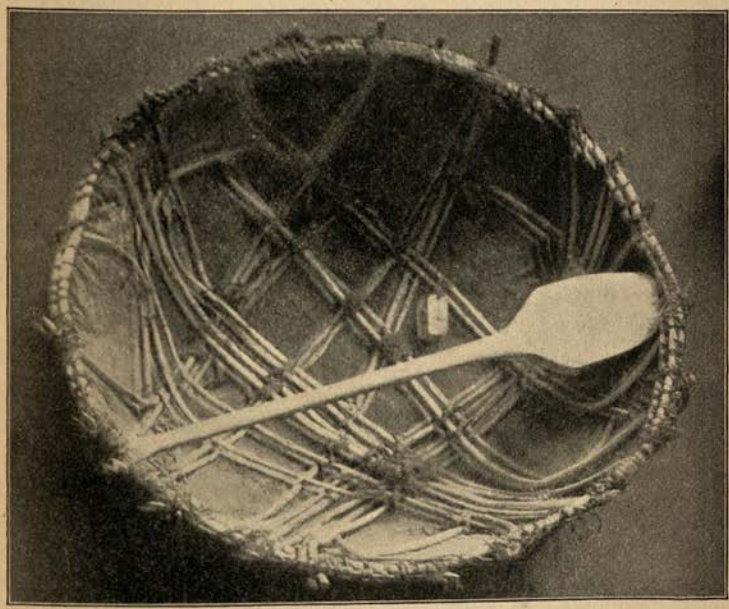

FIG. 29.—MANDAN "BULL-BOAT" OR CORACLE.

the medium of a third person." Among the Omahas neither the mother-in-law nor the father-in-law will hold any direct communication with their son-in-law; nor will he, on any occasion or under any consideration, converse with them, although no ill-will exists between them; they will not, on any account, mention each other's name in company, nor look in each other's faces; any conversation which passes between them is conducted through the medium of some other person. Nor is this practice confined to America. It occurs as well in Siberia, Mongolia, China, Hindustan, Borneo, Fiji, Central Africa, Australia.

Woman's language.

There is such a thing as woman's language distinct from man's language. Among the Kaffirs "the married woman must *hlonipa* her father-in-law and all her husband's male relatives, ascending—that is, she is cut off from all intercourse with them. She must not pronounce their names even mentally, and whenever the emphatic syllable of their names occurs in any other word, she must avoid it by either using a totally new word or by substituting a new syllable. The son-in-law is placed under the same restrictions toward his mother-in-law. He cannot enjoy her society, or remain in the same hut with her, nor can he pronounce her name."

Division of labor between the sexes.

Among most lower peoples there is a sex division of labor. There is man's work and there is woman's work, sharply defined. Where there is least of this, as also where women work too hard, they age early. Thus, among the Eskimo, where the women dress like men and do very much of the heavy work, they look old at twenty years. We are not sure but the emphasis of this fact might do far more to put a stop to the present tendency of our own women, who are struggling to take the place of their brothers, husbands, fathers, in the world's activities, than any other argument. The penalty of looking old as the result of such experiments might well seem frightful. Two

or three samples, drawn from Spencer, will suffice to show what woman's work usually is. Among the Chinooks, men fight, fish, hunt, build houses, make canoes, fashion weapons and utensils, gather fire-wood, make the fire, cook and serve the food at feasts, assist in cleaning the fish, and trade; women gather roots, make clothing of rushes, grass, etc., assist in rowing canoes and fishing, and engage in trade. Among the Comanches, women do all the drudgery, accompany men to the hunt, skin and dress the carcass, tan the skin, and make garments. Among nomadic Arabs, men fight, drive camels, do needlework, tan skins; women cook, tend the flocks, carry water, do most of the menial work, milk goats, sew skins, weave tent coverings of camels' and goats' hair. Among the Todas, the men tend cattle, do dairy work, and build; the women do the ordinary woman's work in our sense of the term. The men bring the water and the wood; the women embroider, sing, etc.

Age of marriage.

Turning now to the marriage, we find that the participants may be young or old, and of equal or unequal age, varying with the people or the race. Many people betroth the children at a tender age. The Chinese sometimes do so before the children are born; coast negroes betroth girls early; Chippewayans betroth infant girls to grown men. Marriage itself may be very early. Abyssinian girls at eight or nine are married to boys their own age; among Parsees marriage is performed in infancy or early childhood; the girl bride of the Hindus has recently occupied a considerable share of public attention. Morgan tells us that among the ancient Iroquois a young warrior was always married to a woman greatly his senior, on the supposition that he needed a companion experienced in life's affairs. The marriage was also deferred on his part until he was twenty-five years of age, that he might be inured to the chase and war before being weighted by responsibility.

Thus, often, at twenty-five he was married to a woman of forty, usually a widow, while at sixty as a widower he would marry a maiden of twenty. Among the Kirghis, Mrs. Atkinson says: "At one house we saw a married couple where the woman was thirty and the husband a mere boy. He was being punished as a child would be. The cause of such marriages is that the boys are orphans who must be cared for."

Preliminary ceremonies.

Among many peoples there are certain preliminary ceremonies. Thus the Khonds and Chinese go through a mass of divinations to determine whether the time and conditions are propitious. Among the Khonds, when the day approaches a *bygah* is called to fix the propitious moment. To ascertain this he places a *lota* of water on the ground before him. The fathers and the village elders stand around. The *bygah* takes up a grain of wheat in each hand, and, holding them over the water, with many prayers to the deity for his favor, he drops the two grains at the same moment into the water. If they meet in the water on falling, the moment is regarded as propitious. If they turn in opposite directions, the time is unfavorable; the deity is then sacrificed to, and the *bygah* tries again, usually successfully. As to the Chinese, the elaborate divination which they conduct is too well known to require description.

The wedding.

The marriage ceremony proper varies greatly in different parts of the world; most of them plainly fall into one of three categories, which have been pointed out by Starcke: first, the capture symbol; second, the meal symbol; third, the protector and hunter symbol. A few examples, taken mainly from Lubbock, will illustrate marriage by capture.

Marriage by capture.

Among Khonds, Campbell says: "I heard loud cries proceeding from a village near by. I rode to the spot and there saw a man bearing away upon his back something enveloped in scarlet cloth. He was surrounded by twenty or thirty young

fellows and by them protected from desperate attacks made upon him by a party of young women. The man had just been married, and his burden was his bride whom he was taking home. Her youthful friends were seeking to regain possession of her, and hurled stones and bamboos at the head of the bridegroom until he reached his own village."

With Kalmucks, after the price of the girl has been agreed upon, a sham resistance is always made by her camp people, in spite of which she fails not to be borne away on a richly caparisoned horse with loud shouts and "feu de joie."

With the Eskimo of Smith Sound: "No ceremony—except that the boy is required to carry off his bride by main force: for even among these blubber-eating people, the woman only saves her modesty by a sham resistance although she knows years beforehand that her destiny is sealed and that she is to become the wife of the man from whose embraces, when the nuptial day comes, she is obliged to free herself, if possible, by kicking and screaming with might and main, until she is safely landed in the hut of her future lord, when she gives up the combat very cheerfully and takes possession of her new abode."

In New Zealand "a man asks consent of the girl's father or nearest relation. When he then attempts to carry her off she resists with all her strength, and, as girls in New Zealand are pretty robust, sometimes a fearful struggle takes place. Both are soon stripped to the skin and it is sometimes the work of hours to remove the fair prize one hundred yards. If she breaks away she flies, and he has all to do again."

This symbol of capture is exceeding widespread. It occurs among Australians, Malays, in Hindustan, Central Asia, Siberia, Kamtschatka, among Eskimo, Redskins, in Brazil, Chili, Tierra del Fuego, the Philippine Islands, the Fijis, with Kaffirs, Arabs, negroes, in Circassia, and traces of it are found in Europe.

The second symbol, that of the meal or the like, is found among numerous peoples. Thus, among the Veddahs, the man applies directly to the girl's father. If there is no objection, the father calls his daughter, who comes forward with a cord of her own twisting in her hand. This she ties about the man's waist in place of the cord he has previously worn. Among some natives of New Guinea both parties sit in front of an idol. The bride gives the groom tobacco and a betel leaf. They then join hands. Among the Chibchas it is said that the man first sends a mantle to the father of the selected maiden. If it is not returned to him, he immediately sends another mantle, one half a deer, and a load of coca. The next night, before daybreak, he seats himself at the door of the house where his chosen one dwells, making only noise enough to excite attention. The girl calls out: "Who is outside; is it perchance a thief who comes to steal or to look for me? I do not owe any one anything, nor do I entertain guests." The groom remains silent outside. Presently the bride brings out a large gourd of *chica;* coming close to him she first tastes it, then gives to him. He drinks as much as he can and the marriage is concluded. Of the ancient Peruvians Herrera said when all had been agreed the bride and groom fasted two days, abstaining from salt, flesh, spice, and all liquors. After the fast the couple met; the next day the bride went with women to a special spring, whence she brought on her back a pitcher of water, and from it and a sort of grain made a beer. The bride, standing behind the groom, sitting on a chair, then gave him to drink and drank herself.

The meal preparation symbol.

Similar to this symbol and frequently connected with it is the symbol of submission. Thus among the Todas the ceremony consists in the groom's placing his foot on the head of the bride; she also performs some simple household duty. The Fulahs make this symbol very realistic; the wife is first beaten

by the father and then by the husband to show that she passes from paternal to husband's authority. Of course, in this whole meal and submission symbol, the meaning is plain; it signifies that the wife undertakes to be obedient and to perform wifely duties.

Protector and hunter symbols.

The matter is not always, however, so one-sided, and in the third, or protector and hunter, symbol we have the obligations and the duties of the husband presented. Among the Iroquois, on the day set, the maiden was led by her mother and friends to the home of the intended husband. She carried a few cakes of bread to present to her mother-in-law as evidence of her skill and usefulness. After this the old woman gave the mother of the girl some venison as evidence of her son's ability to provide food. So among the Creeks, we read in Schoolcraft that the man who wishes to marry kills a bear with his own hands and sends a pan of its grease to the maiden. If she receives it, he next goes to help her hoe her garden; then he plants her beans and sets the poles for them to climb on. Meantime he tends the ground until the beans are climbed up. They then take each other. Among certain Arabs Baker tells us that at marriages there is much feasting. The groom is whipped by the bride's relatives to test his bravery. The whipping is severe, with heavy whips of thick skin, and is done upon his bare back and ribs. He must appear to enjoy it; if he does so the women spectators cry aloud with delight.

Forms of the family or of the marriage relation.

The forms of the family vary greatly from people to people. If we look over the whole realm of family structure we shall find a number of well-defined types. For example:

(*a*) *Group marriages.* In which a group of men, more or less well defined within the limits of a tribe, take for wives a similarly defined group of women. This is best shown in Australia, where all the men of one clan are married to all the women of another clan.

(*b*) A form of *limited group marriage* where a family of brothers marries a family of sisters. This is found among the Todas.

(*c*) *Polyandry.* Where one woman has several husbands. This is not uncommon in Tibet and among the Nairs.

(*d*) *The Levirate.* This is the practice of a brother taking for wife the widow of his older brother. It was custom among the ancient Jews and has prevailed more or less markedly among Mongols, Kaffirs, Yucatanese, Nairs, and others.

(*e*) What we commonly call *Polygamy*, but which would better be called *Polygyny*, where one man has several wives. In such cases it is but rarely the case that the latter wives have full recognition. Nor are there any peoples where polygyny is general. It is only the more powerful and rich who can afford to have a multiplicity of wives.

(*f*) *Monogyny*, temporary in its character, where one man is married to one wife, and where the relation continues only at the wish of both parties. Such monogyny is not uncommon, and as a matter of fact among most lower peoples it is quite as permanent as any other form of marriage.

(*g*) Monogyny of a permanent character, such as is said to exist among ourselves, in civilization.

Relationship and kin.

As we look at the different peoples of the world we find a different view of relationship between parents and children from what we ourselves have, and different ideas regarding descent of name and property. Thus, there are many peoples among whom the head of the family is the woman, where the relationship between the mother and the child is completely recognized, where the child takes the name from the mother and receives advantages from mother and mother's kindred. Such a condition of maternal descent and maternal headship is found in almost every part of Africa, in Australia, in India, Polynesia, and prevalently in America.

Kinship terms.

Not only do we thus find extremely different forms of the marriage relation and different conceptions of kinship and descent, but we also find connected with these matters peculiar systems of consanguinity shown by peculiarity in kinship terms. Lewis H. Morgan, at one time America's most prominent and best-known ethnologist, became profoundly impressed by the terms which he found in use among the Seneca Indians for denoting relationship. He made a careful study of this matter the world over, and from it worked out some conclusions which he used as fundamental in his theories of primitive society. We have no time to discuss the matter here, but refer to it in passing.

Theories in regard to the primitive family.

From these three elements, namely, the varying relation between husband and wife, the facts presented in maternal descent, and the peculiar nomenclatures, writers have worked out startling theories in regard to the primitive family. These theories differ somewhat among themselves. Thus, Bachofen believed that there was at first a condition of hetairism—sexual promiscuity; that out of this grew a condition where the woman was at the head of things, controlling matters of descent, etc., which he calls the matriarchate, or woman government; after this, and from it, grew up our present condition, which he calls the patriarchate, the government of the father.

Bachofen's views are not at present adopted, having been superseded by the somewhat more clearly presented and logical views of McLennan and others. McLennan believed, also, that there was at first hetairism, or promiscuity; that out of it grew up polyandry; that this was succeeded by the Levirate; and that then came a condition of endogamy, where a man could only marry a woman of his own tribe, and lastly exogamy, where the man might or must take a wife from outside. Lubbock holds that there was first hetairism; then marriage by actual capture; that after it came exogamy, or marriage out-

side the clan. He considers endogamy, the necessary marriage within the clan, as exceptional and not in the normal development; polyandry also he considers as abnormal. These theories have been presented with great vigor by these various authors and have been discussed and presented fully by many followers. We may say in some form the general theory has gained very wide acceptance. Recently, however, there has been written by Starcke a work called "The Primitive Family," which, on the whole, presents what to us seems a more reasonable and natural condition.

Starcke's view.

Starcke holds that there never was a period of hetairism. He claims that the division of labor was early established between man and woman; that the impulse driving man to marriage was the desire to get some one to work and keep house. As boys in the family grew up they wanted wives to care for them and their game. The young man might carry off the young woman by force, or he might have gone to live with her until something happened to drive them from the home. Such connections were monogamous and often permanent. A second motive in taking a wife was to have her produce children. Children were of great service in primitive communities; they increased the father's importance. Polygamy arose from the desire to show wealth, power, numerous children; usually it can only be indulged in by the rich.

The marriage ceremonies which we have spoken of quite fully illustrate one of three things: the capture symbol shows the sorrow of friends at separation; the food preparation symbol suggests the wife's duties; the protector symbol suggests the husband's duties. These are all symbolical rather than remnants of ceremonies illustrating past conditions. With polygamy comes the erection of separate houses for wives and the development of maternal descent, etc. Polyandry is not earlier than other forms, but later, and is found only where

the family communistic idea is developed. Earlier monogamy, based generally upon the need of help and service, may pass through polygamy and polyandry into the later monogyny which we now recognize, based generally upon sex.

CHAPTER XXIV.

RELIGION.

THERE has been much discussion among writers as to whether there are any peoples living who have no religion. Plenty of French authors, some German, and a few English, state plainly that there are atheistic, *i. e.*, non-religious, peoples. Thus, for example, in Lubbock's "Origin of Civilization" one may read a lengthy list of such tribes. In many cases, however, peoples who have at first been described as totally without religion have been found on further investigation to have quite fully developed conceptions in that direction. Among all people the religious ideas and thoughts are the most difficult to get at; they are rarely spoken of before the stranger. It is possible that those who claim that there are existing tribes who have no sort of religious notions have gone too far; it is curious, however, how little those who insist that all peoples have religious ideas are contented with. For it seems that there are some peoples who have as religious thoughts only two notions—first, that there is a future life; second, that there are spirits.

Are there tribes without religious ideas?

Probably, if all religious conceptions which are now held could be blotted out of existence, all peoples would very soon have a new set of religious ideas which would not, on the whole, vary greatly from those which we find at present among savages and barbarians. How would they arrive at such ideas as those of a future life, and of the existence of spirits? The conception of a soul as distinct from the body is a simple one and naturally aroused. Tylor and others have indicated the method. All men dream; the lowest savage dreams; dogs

How do certain religious ideas arise?

The idea of a soul.

and lower animals dream. In the dream the person goes afield, visits places far remote, does things either apparently with or against his will. When he awakes he tells where he has been, what he has done. Those who have sat by know that he has been nowhere, but has been lying sleeping in the hut. It is as easy to convince the savage dreamer of his mistake as it is to prove to the ones who have sat by the slumberer that they are wrong.

What happens to this one happens in time to all. How explain it? Surely there must be, so the savage reasons, some part of man which goes abroad and makes these visits, something invisible, but something which feels and thinks and acts like himself. It is the soul. In the same way the savage man, creeping to the smooth and quiet pool of water and looking in, sees his reflection; form, feature, expression, all are his; it must be the other self—the soul. Again, when one walks in the sunshine there ever accompanies him a dark companion; halting when he halts, running when he runs, moving with him, not to be got rid of—shade, soul. There can be no question that if men forgot they had souls the idea would be fresh kindled by the dream, the reflection, the shadow. At times some savage or barbarian falls helpless, lies apparently inanimate in a swoon—his soul has gone suddenly from him; when it returns he lives again. But at last some day the soul leaves never to return. Is it tired of its clay tenement? Has it found some happier home? The future world stands ready for such souls.

Possession.

Occasionally the savage sees his fellow suddenly changed; he falls, gasps, struggles violently with clenched fists, with struggling, shaking limbs, with teeth set, with eyes rolling; he is an object qualified to inspire terror. *We* say, of course, the man is in a fit; the savage or barbarian believes he is possessed by some other soul, that enters into him, controlling

him and using him. The doctrine of possession is a very ancient one, which lasted long even in civilization, and has not yet entirely disappeared among all peoples.

Souls of things.

The idea of a soul once fully born, what more natural than to recognize souls in animals; but if souls in animals, then souls in things. We have already seen how primitive man personifies and animates everything about him. We have seen how he looks upon the clouds, the lightning, the sun, the moon, the stars, bodies of water, the winds, as living persons. But if so, they too have souls, and this idea that things have souls is almost as old as the race itself. There is no meaning in the burying of weapons with the dead, unless the souls of the weapons are to accompany the soul of the dead man and be of use and service to him in the land beyond the grave. Among the Sacs and Foxes, when a child dies a little dog is killed at the same time, to accompany the soul of the dead one and to find the path, a difficult one, to the land of souls. Among hundreds of rude peoples the weapons, shield, and decorations of the warrior, the tools and implements of the woman, the toys of children, are buried with the dead; with all are buried food and drink enough to last until the journey is accomplished.

Spirits as distinct from souls.

The soul of things and persons being once fully grasped, the idea of spirits separate from things arises easily. It is a higher thought. It is a point worth emphasis. A tree may have a soul that comes and goes at will—that is one thing. There may be a spirit outside of a tree, that watches over it—that is a different thing. The two are related, the one thought may be derived out of the other, but they differ. The soul within a creature or a thing may be more or less helpful; a spirit disembodied may be good; it may be bad. The soul within the object is worth guarding against; but the spirit dwelling free and unconfined must be propitiated.

Spencer's view.

There are two quite prominent theories regarding the origin of spirits. Tylor in his remarkable treatise presents nearly the ideas given above; Spencer, on the contrary, holds that the idea of spirits is derived only from that of the souls of men; the spirit, says he, is a ghost.

Lubbock's classification of religions.

Sir John Lubbock classifies the stages of religious thought as follows: "First, *Atheism*, the absence of any definite ideas upon the subject. Second, *Fetishism*, in which man supposes he can force the deities to comply with his desires. Third, *Nature worship* or *Totemism*, in which natural objects, trees, lakes, stones, animals, etc., are worshiped. Fourth, *Shamanism*, in which the separate deities are far more powerful than man, and of a different nature. Their place of abode is also far away and inaccessible save to the Shaman. Fifth, *Idolatry* or *Anthropomorphism*, in which gods are patterned after men, but powerful and still part of nature, not creators. The deities are represented by images or idols. Sixth, where the deity is regarded as outside of nature and a creator. Seventh and lastly, where we find morality connected with religion."

The classification is not altogether satisfactory, but may serve us as an outline. It is well worth noticing the last point that Lubbock suggests. We are so prone to think of religion and morality as joined, necessarily related, and so dependent on each other that the thought of one without the other seems unnatural. Yet, there are whole codes of morals—and in some cases quite excellent—totally unrelated to the religions of the people holding them; on the other hand, there are religions remarkably complex and well developed in which there is no element of moral teaching.

Religion and morality not always connected.

We have already said enough regarding tribes without religion. There may be such; but those usually named are uncertain. On the whole, it would be safe to say that man is a religious animal. It is quite common to look upon fetish

FIG. 30.—SHINTO PRIEST. Japan.

worship as the lowest form. Notwithstanding all that has been written on the subject, it is a little difficult to find exactly what men mean by fetishes. The Africans—that is, negro Africans —are usually the stock example of fetish worshipers. Yet, Chatelain, who knows much of Angola negroes, insists that fetishism, in the usual sense of the word, characterizes more strongly the ignorant Portuguese Catholics in that district than it does the negroes. A fetish may be almost any object; generally, however, something unusual or peculiar, strange or suggestive. It is supposed to have power and to be able to help or hinder enterprises. It may or may not be portable, but very commonly is small enough to be carried. To it requests may be made, gifts and offerings presented. If the venture is successful the fetish is rewarded; if failure comes, it may be discarded, punished, destroyed.

Fetish worship.

Perhaps as good examples of fetishes as could be mentioned are those described by Cushing among the Zuñians. To the Zuñian there are six great parts of the universe: the north, the west, the south, the east, the above, and the below. Each of these districts has its color. The north is yellow, the west blue, the south red, the east white, the above all colors, and the below black. Each of these districts also has its animal; the north the mountain lion, the west the bear, the south the badger, the east the wolf, the above the eagle, the below the mole. Little representations of these animals are made in stone; to them are fastened arrow-heads and feathers. They are fetish prey gods of the hunt. In the series of fetishes the coyote replaces the bear and the wild cat replaces the badger. These little fetishes are kept by priests; they are greatly venerated and serve as mediators between man and the sacred animals they represent. Prayers are made to them and ceremonies conducted with reference to them; sacrifices of plumed sticks are offered them. Each of the six occurs in the six col-

Zuñi fetishes.

ors having power over the district appropriate to the color.

When going on the chase, the hunter takes his weapons and goes to the house of the deer medicine, where a wicker basket containing these fetishes is placed before him. Facing the direction of the fetish which he means to use, he sprinkles into and over the basket sacred meal. He then holds a small quantity of meal in his left hand over the region of his heart, removes his head-band, and prays. Scattering prayer meal in the direction he proposes taking, he selects his fetish. Placing it to, or toward, his lips, he breathes upon it and gives thanks. At every stage of his hunting journey he performs ceremonies. Having killed his game, he holds it to his heart, then takes out his fetish, breathes on it, bids it share, and dips it in the blood. He then scoops up some blood with his hand and sips it; then tears out the liver, ravenously devours a part of it, and exclaims, "Thanks." In skinning and quartering the game he cuts out the inner lobe of the ear and blood clot of the heart and some hair. Of these, with black paint, corn pollen, turquoise beads, and shell dust, he makes a ball, and deposits it, with a package of prayer meal, on the spot where the animal died in a little grave, repeating a prayer the while. On his return home the fetish is returned with prayers for future help, thanksgiving, and reminders that it has been fed and supplied with drink.

Nature worship.

There are many different natural objects which are reverenced. The Tlingits and Haidas of the Northwest coast worship mountains, the sun, the moon, and many other natural objects. Every one knows of the animal worship of the old Egyptians. Very curious is the worship of the cow as found among the Todas. Serpent worship is found almost the whole world around. Trees are still sacred to many peoples and must have been much reverenced by our own ancestors in the forests of Western Europe. Very frequently it is not the thing

or place itself that is thus worshiped, but an indwelling spirit recognized as distinct from the object. Thus whirlpools and eddies in streams are often thought of as the abode of some evil spirit which attempts to drag down passers in canoes. At such places the barbarian usually drops little gifts as offerings to the malignant spirit. The Lorelei in the Rhine is the type of many a being feared by lower and ancient men. Where the Mississippi and the Missouri come together Father Marquette found that the Indians, fearing the whirls and eddies there, left gifts.

Local spirits.

Where spirits capable of doing harm so abound every one must be upon his guard. A charm, an amulet, words for repetition to disarm the mysterious power—such things are much in vogue. Any man may have such objects for his help, may know some such protecting lore. Certain men, however, devoted from childhood or "called" in later life, make a special study of spirits and the mode of dealing with them. Such men are Shamans. The word was first used with reference to the Shamans of Siberia and other parts of Northern Asia. The Shaman is found, too, in full perfection among Alaskan tribes, and even among some interior Indians and in Eskimo land.

Protection against spirits.

The Shaman.

"Everywhere he is a marvel. He is seen to summon spirits, to assume and transfer diseases, to unbind himself when tied with ropes; he falls into trances, descends to the lower world in search of souls of the sick, ascends into the highest heaven, is clairvoyant and prophetic." Everything about him has its mystic meaning. "His tambourine is at once the summoner of spirits and the steed upon which the Shaman mounts to heaven; covered with strange pictures it possesses in itself great spirit power." Among the Tlingits the Shaman's dress is helpful; his mask, frequently carved with animals, imparts spirit power; his wooden pillow, carved perhaps at the ends into the shape of land-otter heads, whispers spirit knowledge to him through his slum-

bers; little carved figures of wood called "*yeks*" stand as guards over him while he sleeps, keeping off harmful spirits and adding to his knowledge; little ornaments of ivory hung on his dancing-shirt rattle, and each one has its power to keep off mysterious influences; his carved wands, covered with designs, battle for him with all the spirits which are represented in the carving. The Shaman brings upon himself conditions much like catalepsy; he becomes convulsed, loses reason, speaks with the spirits, communes with invisible powers, prophesies, receives communications. Is it any wonder that such a man has complete power over those among whom his life is spent? Of course, as diseases are commonly looked upon by lower races as due to spirit influence, the Shaman is a physician who treats sickness. While he may have some knowledge of the medicinal properties of herbs and roots and barks, his medicines are usually spiritual—conjuring, sorcery.

Among most northwestern tribes, as we have seen, the Shaman is in vogue. Further south we find him disappearing, and in his place, as among the Kwakiutl, we find great secret societies, the members of which have gained power over spirits, and these act collectively, either for their own benefit or for that of patients or patrons. Hoffman has fully described the medicine society of the Ojibwas. Among these people there are three classes of mystery men: First, the Midi, who is simply a Shaman. He is a member of an order into which he must be initiated. Passing from degree to degree, four in all, he gains greater and greater spirit power. Second, the Jessakkid. These form no association. Their power is a gift from Animiki and is received in youth. They are seers and prophets; they invoke and cause evil; they can untie bonds and exorcise demons. Third, the Wabeno, prompted by youthful dreams to fast. He practices medicine independently; he is a sorcerer, medicine man, and fire-handler.

Secret societies for spirit influence.

Mystery men of the Ojibwa.

To show the relative abundance of these different types of mystery men, we are told that out of fifteen hundred Menominee Indians there were one hundred Midi, five Jessakkid, and two Wabeno. The Ojibwa youth retires to the forest for his first fast. When much reduced he becomes hysterical and ecstatic. Whatever appears to him in visions becomes his personal spirit, or *Manido*. An effigy of the *Manido* is made or drawn on bark and worn. In order to become a Midi, the young man must be initiated by those already members. The most significant part of the initiation is the shooting of the *migis*. The four leading priests shoot the *migis* at the novice. At the final shot he falls as if lifeless and lies until revived by the chief priest. After thanks have been given and ceremonies of various kinds performed, the newly-elected Midi tests his own power. He takes his medicine sack in which is his *migis* (which is a piece of shell) and successively shoots at all, saying just before he aims, "*Ya, ho, ho, ho, ho.*" Each falls, recovering only after three or four have been shot after him. All then put their *migis* in the right palms, taking their sacks in their left hands, move around and show the *migis* to everybody present crying, "*Ho, ho, ho, ho,*" in a quick, low tone. Each pretends to swallow his *migis*, strangles, gags, then spits it out and falls as dead. They gradually recover and put away the *migis* in the medicine sacks. Spirit power increases each time the man undergoes the shooting by the *migis*, and it is in this stage that such powers are absorbed. Each Midi may have a birch-bark record, on which is recorded the origin of the society, his personal Midi history, and the like.

A Jessakkid, or a Midi of the third degree, removes disease demons from the body of patients with bones. He has four or more hollow bones made of the leg-bones of large birds, as thick as a finger and four or five inches long. After going through certain ceremonies, he goes down on all fours near the

patient with his mouth close to the ailing part; he rattles and sings to drive the spirit to a certain point. Then he immediately touches one end of a bone there and strikes it apparently down his throat. He does the same with the other three, although the last one protrudes from his mouth, is put against the part, and violently sucked. He then crawls away, violently retches, spits up the bones, and recovers.

The Midi of the fourth degree invokes and communes with *Gitche Manido* himself. He is almost equal to Minabozho. He does marvelous things. For example, one is said to have shut himself up in one of two wigwams; fires were built about the one in which he was. After the place was extremely hot he was seen to crawl out from the other wigwam, at a great distance, totally unharmed.

Sacred numbers.

We have seen that the Zuñians attribute sacredness to the cardinal points. We have seen that the number four recurs in the ceremonies and performances of the Midi. There are four degrees; the man uses four bones in treating disease; there are four chief officiants in the initiation ceremonies; the number four occurs many other times, in connections which we have not described. We should find it sacred throughout North America; almost every tribe looks upon it with feelings of awe and reverence. We should find, also, other sacred numbers, as seven among the American Indians. We may not here discuss the matter. It is enough to say that very early the idea of sacredness attaches to numbers and that all primitive folk and ruder tribes have sacred numbers.

Comparative religion—a great field.

A most important field of study lies before us, but we may not touch it; to trace the religious beliefs through higher forms; to show how one idea after another develops; to see just what the great religions of the world are, and how they came to be, and what they owe to older and ruder forms. We are considering only some first steps in human progress. We

CHAPTER XXV.

RELIGION; THE DEAD MAN.

The four peculiar members of a society.

IN ANY lower population of mankind there are four individuals whom to know thoroughly is to know the people. These four are the child, the woman, the priest, and the dead man. The common man is much the same everywhere, among all people and at every stage of culture. He is the worker, the hunter, the protector. Life in his case is prosaic. There is little of superstition clustered about him, and there is little to render him a peculiar being. On the other hand, about the child, the woman, the priest, the dead man, there have gathered all sorts of curious notions and strange practices; about all four there lingers very much out of the ancient past. To know the thoughts and the feelings relative to these four is to know thoroughly the psychology of a race.

Our authorities.

In this brief discussion regarding the dead man, we shall quote much from Spencer on the one hand, and from Yarrow on the other. To them more than to any others must the facts here presented be referred, although in both cases these authors speak at second-hand.

Savage and barbarous notions regarding death.

Consider first the ideas which savage and barbarous people have concerning death. Among the Australians "no matter how evident it is that death has been the result of natural causes, it is at once set down that the defunct was bewitched by the sorcerers of some neighboring tribe." Among the natives of South Africa no one is supposed to die naturally. "The Bechuanas and all the Kaffir tribes have no idea of any

man's dying except from hunger, violence, or witchcraft. If a man die, even at the age of ninety, if he did not die of hunger or by violence, his death is attributed to sorcery or to witchcraft and blood is required to expiate or avenge it." On the Guinea Coast "none on any account dieth but that some other has bewitched them to death." In South America "even if an Abipone die from being pierced with many wounds, or from having his bones broken, or his strength exhausted by extreme old age, his countrymen all deny that wounds or weakness occasioned his death, and anxiously try to discover by which juggler and for what reason he was killed." Similar beliefs might be quoted from many North American tribes.

The method of disposing of the dead varies greatly among different people. Various classifications have been suggested; the following may answer for a tentative grouping:

The method of disposing of the dead.

Modes of disposing of dead.

1. Burial.
   - Simple.
   - Urn.
   - Water.
2. Cremation.
3. Exposure.
   - (*a*) On scaffolds or in trees.
   - (*b*) In caves.
   - (*c*) To animals or birds.
4. Embalmment.

Some examples of these different methods will be interesting and may prove instructive. In them we should notice not only the method of disposition itself, but also the attendant circumstances and ceremonies. Very simple is the Pima burial. The body is tied in a sitting position with ropes passing about the neck and under the knees; a grave four or five feet deep, two feet in diameter—a perfectly round pit—is dug; on one side at the bottom of this pit a vault is excavated for the body, which is placed therein; the pit itself is then filled with stones, twigs, logs, etc. Among the Otoes a vault-like tomb is made into which the chattels of the deceased are carefully unloaded; the bottom, which is wider than the top, is spread with straw

Examples of (1) burial:

Pima.

Otoe.

matting; the sides are hung with shawls and blankets; trunks, pottery, etc., are piled about the sides, a pony is strangled, often also a dog; the heads of both are put on the grave after it is filled. The deceased, lowered into the open grave, has buried with him his saddle, bridle, and the like; logs are fitted carefully over the grave and earth heaped over all. All the property of the deceased is distributed to outsiders. A midnight vigil is held for four days and nights, a small fire is kindled at sunset, and relatives meet and mourn.

Meaning or purpose of the ceremonies.

There are several points of interest in connection with this Otoe burial, which on the whole is a fair type of American Indian funeral ceremonies. Notice the burying of property with the dead; we have already seen that among savage men objects have souls. Of course the dead man cannot use the material objects buried with him, but the soul of the dead man uses the soul of the object in the spirit world. It is also interesting to observe in this case the killing of a horse and of a dog, which go with the dead man as his servants and helpers. Very common, too, is the practice of distributing the property of the dead to outsiders; it prevailed throughout North America and frequently reduced the family of the deceased to beggary. The midnight watch is interesting and the kindled fire, particularly as both were kept up for four days; it will be remembered that four is the sacred number of most American Indians. The statement made in regard to the meeting of relatives and their mourning has reference to what is commonly called "wailing." It is a simple thing to speak of "wailing for the dead," but no one who has not heard the dreadful outcry of barbarous people on such an occasion, can conceive of its terrible character.

Position of the face sometimes a matter of concern.

Among many peoples the position of the face or head of the dead man when buried is a matter of great importance. Thus the Mohammedans place the body so that it faces the Kaaba;

many peoples have the dead face the rising sun; some place them with the face toward the setting sun. In all such cases some religious idea or superstitious belief underlies the practice.

Moki. Among the Moki Indians, who usually bury the dead in cists or coffins of stone or wooden planks, the body is set up with the hands near the knees clasping a stick; the soul finds its way out of the grave by climbing the stick, which projects after the grave is filled. This idea, no doubt, takes its rise from an incident which occurs in some of the cosmogonic stories of these people; long, long ago they ascended from a world below to this present world, where they now live, by climbing up a stick which stuck through the ground.

Tupi. In some cases the evident attempt is made to render the grave as familiar and agreeable to its occupant as may be. Thus among the Tupi in South America a chief's corpse was covered with honey and coated with feathers; the sides of the grave were lined with stakes forming a vault large enough for hanging a hammock within. The *maraca*, weapons, food, and pipe of the dead man were all placed within; a fire was made under the hammock, as if he were still living; the vault was then roofed and covered, and the family lived upon the grave.

Aztecs. Among the Aztecs of Mexico the disposition and treatment of the dead varied with the class—not the social class, but class based upon the mode of death. A green stone was frequently put in the mouth of the dead; it represented his soul. The body was placed in a sitting posture and saluted by friends; it was then clad in many garments, which varied with the death suffered. Very curious were the papers attached to the corpse as a protection against the dangers of its journey to the spirit land. Men who were slain in war were burned and their souls went to the land of the sun; persons who were struck by lightning, or who were leprous or dropsical, or who had been

drowned, were buried and went to Tlaloc; all others were burned and went to Mictlan, the land of the common dead, a place dreary, though not one of punishment.

Cairn-making.

Very common is the building of a cairn, or heap of stones, over a grave. In such cases it is customary for each passer-by to add a stone to the ever-increasing pile. This practice has a wide range—North American Indians, some Mexican tribes, Africans, several Asiatic peoples, and some populations of Europe, heap up cairns.

Urn burial.

Urn burial has been extensively practiced, although it is not as common as the practice of gathering bones into urns after the flesh has decayed, or the putting of ashes of cremated bodies into urns. Among the Coroadoes the dead were buried in a sitting posture in great earthen jars. In the Caucasus a peculiar form of burial under inverted urns formerly prevailed. In Georgia and in Nicaragua dwelt tribes whose great burial urns are still dug up from time to time. Very pretty is the little square pottery box or coffin with a lid fitting over it found in an Arkansas mound and containing the skeleton of an infant.

Burial under water.

Burial under water is by no means common and most of the cases which are on record are historic and simply individual.

(2) Cremation:

Cremation is a widespread practice. It was practiced anciently by many peoples, as, for example, the Romans, and has recently been in vogue among as widely separated peoples as the Hindus, Natchez, and Northwest coast tribes. The

Todas.

Todas—that remarkable hill people of Southern India—cremate their dead, and among these people we find two ceremonies; the first is called the green funeral, the second, the dry funeral. In the former the corpse is taken to a grove, laid on a pyre, and burned; a few buffalo are slaughtered to accompany the deceased; the ashes are then collected and preserved. This is relatively a simple ceremony. The other—the dry

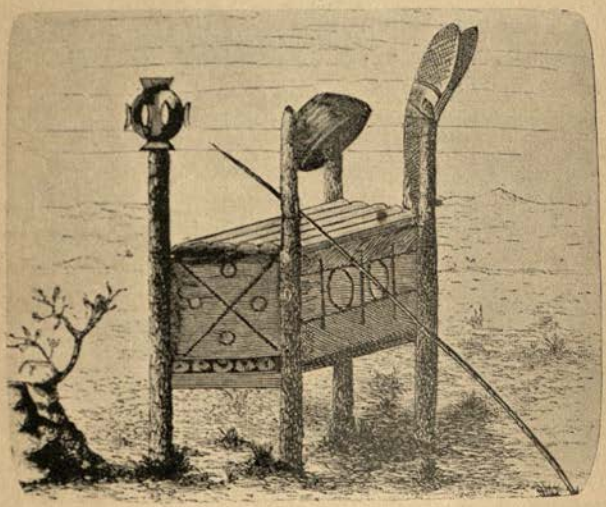

FIG. 31.—ESKIMO GRAVE-BOX.

funeral—involves much display. The neighboring tribes are invited and regaled with refreshments during the performance. In the center of a ring, on a pyre of dry wood, the priests place the mantle, bag of ashes, ornaments, and wand of the deceased, with gourd, coarse baskets of grain for food, etc., and all are ignited. The mourners stand around, the women with heads covered with mantles and the men monotonously crying, "*Heh, hey, heh, hah.*" Every vestige of the remains is destroyed by the fire. The metal ornaments are sought for among the ashes to be taken home respectfully by the family. The ashes are buried then under a large flat stone in the center of the circle. The dry funeral takes place a year after the green.

Aztecs.

Reference has already been made to the different ways in which the Mexicans dispose of their dead according to their mode of death. It will be remembered that soldiers who were killed in battle were burned; suppose, however, that the body were not recovered—that would make little difference; a figure of the dead would be made in wood and burned upon the fourth day; its ashes would then be treated like the ashes of a veritable corpse. Cremation scenes are frequently accompanied by the most vigorous and dreadful evidences of mourning. Thus we are told that a Senel chieftain was burned upon a pyre; gold coins and all his finery were put upon or about him; as the pyre began to burn the mourning commenced, consisting of howling, gashing the bodies with knives, tearing the hair, leaping, etc.; as the flames mounted higher and higher these vigorous signs of mourning waxed greater and greater.

Senel.

(3) Exposure: In trees and on scaffolds.

The exposure of the dead on trees and scaffolds is very common. It prevails in many parts of Australia and is a custom among many tribes of North American Indians. Formerly the Sioux practiced this method of disposing of the

corpse: wrapped tightly in blankets or robes it was wound with hide thongs and put on to a scaffold; this was about eight feet high and consisted of four corner stakes on which was built a floor upon which the body was placed; the work was done entirely by women; property of the deceased, together with locks of hair from friends, was bound up with the body. After the body had been placed upon the scaffold the women mourned; scarring of the body, so common among American Indians, was indulged in. On the return of the mourners all the family property was distributed. The women of the family kept up the mourning for ten days, the men for a single day, after which they went upon the war-path. Is there not in this last practice a suggestion of the idea mentioned at the beginning of the chapter, namely, that death is due to the mischief of some sorcerer who must be sought and punished?

In boxes.

Among many Eskimo tribes we find burial in scaffold boxes. The body, doubled up on its side, is put into a box made of planks of spruce some four feet long; this is lifted several feet on posts which project above it; the sides of the box are often painted with symbolic designs; articles are attached to the coffin or are put about it; with a woman will be placed the common tools she used in her daily employment; with a man, his weapons and implements of the chase; with both and always a food-dish.

Scaffold burial sometimes temporary.

Among many people we find scaffold burial as a temporary disposition of the dead. Thus, among the Choctaws, the corpse, lightly covered with a mantle, was placed upon a scaffold of eighteen to twenty feet high, erected in a grove near the town; it was left until the flesh easily separated; men, professionally given to such work, would scrape the flesh afterwards from the bones, wash and clean these and inclose them in a casket of bones and splints; this was put in the bone-house, one of which was in every village; when the bone-

house was full a general funeral took place, when each family carried its own dead from the house to the cemetery where the baskets were heaped up and covered by a mound of earth.

Canoe burial. Canoe burial, although not common, is found among a considerable number of people representing widely different stocks. The Chinooks wrap the corpse in blankets and place it in a canoe; the treasures of the dead are then put therein also; blankets and mats cover over the whole; a smaller canoe is put bottom up, fitting within the larger one; the whole is then covered with mats and put on bars supported by posts at the height of four or five feet above the ground. At the end of a year the body is removed and buried. More curious is the practice which formerly prevailed at Port Jackson, Australia; the body, placed in a bark canoe, was set adrift upon the sea. Among the New Zealanders a chief's corpse, wrapped in a mat, was put into a canoe-shaped box; with him was put his war-club; the coffin was then placed on stages, some nine feet high, or suspended to trees, or interred in the house. The Sea Dyaks place their dead chief in his war canoe, with his favorite weapons and his principal property, and turn it adrift.

Parsee "Towers of Silence." The most curious method of exposure, however, is found among the Parsees in India. Their "Towers of Silence," although visited but rarely, are well known. They are situated on the Malabar Hill, near the Black Bay, in a lovely spot. Iron gates bar access to the place. The towers are said to be five in number, built of the hardest black granite, forty feet in diameter and ten to fourteen feet in height, constructed so solidly as almost to resist the ravages of time. The oldest and smallest, built some two hundred years since, is used only for a certain family. The second was erected in 1756, and the three others during the next century. The sixth tower, different in form, stands alone and is used only for criminals. Within these Towers of Silence, which are open to the sky, the bodies of

dead men are placed by special carriers, who have no other business. As soon as the dead body has been laid out and the carriers have withdrawn, the birds of prey, who have been waiting by hundreds, swoop down upon the corpse and in a few moments nothing but picked bones is left. This curious practice among the Parsees is connected with their religious belief that it would be wrong to pollute any of the elements of nature by some other disposition of the dead; the corpse must not be thrown into the water, buried in the earth, burned in the fire, or permanently exposed to the air.

(4) Embalmment.

The fourth and last of the methods suggested in our table—embalmment—is ancient and known to many peoples. Mummies have been found in Alaska, Australia, Egypt, and elsewhere. Perhaps no people have ever lived who were more careful in their preparation for death and in the care of their dead than the Egyptians. Tombs were often bought during the life-time, and years and much money were spent in their decoration. The funerals themselves were to the highest degree extravagant. After the first lamentation the body was taken to the embalmer's and the mummy prepared according to the wealth of the dead or of his living survivors. To prepare a mummy in the most elaborate and magnificent style cost more than twelve hundred dollars of our money. In the preparation of the mummy the internal organs were removed and carefully preserved in four *canopi* or jars, with the lids made in the shape of heads. The first, which was capped by a human head, contained the stomach and larger intestines; the second, dog-headed, contained the smaller intestines; the third, jackal-headed, contained the lungs and heart; while the fourth, which bore the head of a hawk, was the receptacle for the gall and liver. The elaborate wrappings, the rich coverings, brilliant with paint and gilding, in which the better grade of mummies were inclosed, are well known. Nets of beads and bugles,

Egyptian treatment of the dead.

sets of the most curious amulets, each of which had its proper place with reference to the corpse, ornaments and jewelry of the richest kind—all these were placed with the dead. More than this, food and clothing were put in the tomb. If the dead man had been wealthy, real food offerings were made, a head and haunch of beef, a bunch of vegetables, four loaves and four cakes, and a jar of wine. If, however, the man were poor, wooden imitations of these offerings served the purpose quite as well.

Gifts to the dead.

It will be seen that the donation to the dead varies greatly in purpose; it may be money to pay fares upon the journey; it may be garments for use in the hereafter; it may be food to support the dead until he reaches permanent supplies; it may be horses to bear him, or dogs to guide him. It is not strange that among many people it should be considered necessary that the dead person should have a human companion. So in India the widow burns on the pyre of her husband; among the Natchez slaves were dispatched to serve their masters, and a wife might accompany her husband if she chose. There is recorded a speech made by a Natchez mother to her children after her husband's death and before she ascended the pyre: "Children, this is a day on which I have to tear myself from your arms and to follow your father's steps, who waits for me in the country of the spirits; if I were to yield to your tears I would injure my love and fail in my duty. I have done enough for you by bearing you next to my heart, and by suckling you with my breasts. You that are descended of his blood and fed by my milk, ought you to shed tears? Rejoice rather that you are suns and warriors; you are bound to give examples of firmness and valor to the whole nation. Go, my children, I have provided for all your wants by procuring you friends. My friends and those of your father are yours too; I leave you amidst them; they are the French; they are tender-

Companions for the dead.

hearted and generous. Make yourselves worthy of their esteem by not degenerating from your race; always act openly with them and never implore them with meanness."

After the funeral:

Mourning;

What takes place after the funeral is quite as suggestive and interesting as the ideas concerning death, or as the ceremonies attending the disposition of the dead. Mourning is often violent; cutting the hair, neglecting the clothes, gashing one's self, mutilation, are among some of the methods of mourning. The Prussians, the old Greeks, and many barbarous peoples, cut the hair. Both ancients and moderns, in barbarism, have gashed and scarred themselves, and many peoples even to-day cut off the finger joints in sign of mourning. The ancient Romans, the Jews, Chinese, Caribs, Sioux, and a host of others supply fresh food to the dead for some time. We have already spoken of fires built by graves and guards kept thereat. It is a common thing for friends of the dead to keep some part of the corpse, at least for a time. Among the very interesting people of the Andaman Islands, when a death occurs the corpse is removed a short distance from the hut and left for some time. The body, closely compressed and folded, done up in leaves and tied by strong creepers, the ends being knotted to form a sling, is carried to a burial place which is usually a mile inland. The grave is a shallow rounded hole dug with a stick and the hands. Two or three months after the burial the relatives disinter the bones and carry them back to the encampment, where they spread them out and weep over them, after which each one takes a bone. The nearest relative usually takes the skull and jaws. These trophies of the dead are worn, after having been painted red. Among the New Caledonians the toe and finger-nails are cut off as relics, the teeth are extracted, and the skull preserved. Among the Mandans, Catlin described a curious practice:

Food and attention to the departed;

Preservation of mementos;

"There are several of these golgothas, or circles of twenty

or thirty feet in diameter, and in the center of each ring or circle is a little mound of three feet high, on which uniformly rest two buffalo skulls (a male and female), and in the center of the little mound is erected 'a medicine pole,' of about twenty feet high, supporting many curious articles of mystery and superstition, which they suppose have the power of guarding and protecting this sacred arrangement. Here, then, to this strange place do these people again resort to evince their further affections for the dead, not in groans and lamentations, however, for several years have cured the anguish, but fond affection and endearments are here renewed, and conversations are here held and cherished with the dead. Each one of these skulls is placed upon a bunch of wild sage, which has been pulled and placed under it. The wife knows, by some mark or resemblance, the skull of her husband or her child which lies in this group, and there seldom passes a day that she does not visit it with a dish of the best-cooked food that her wigwam affords, which she sets before the skull at night, and returns for the dish in the morning. As soon as it is discovered that the sage upon which the skull rests is beginning to decay, the woman cuts a fresh bunch and places the skull carefully upon it, removing that which was under it. Independent of the above-named duties, which draw the women to this spot, they visit it from inclination, and linger upon it to hold converse and company with the dead. There is scarcely an hour in a pleasant day but more or less of these women may be seen sitting or lying by the skull of their child or husband, talking to it in the most pleasant, endearing language that they can use (as they were wont to do in former days), and seemingly getting an answer back."

Communion with dead;

The mourning of parents in New South Wales is shown in a very material way; the flesh of dead children is eaten, at least in part, as a token of grief and affection. Among the Uaupes

Cannibalism;

the corpse is disinterred a month after burial, put in a great pan or oven over the fire until all the parts are dry and smell horribly. The black mass left is pounded to powder and mixed with liquid in vats. This is afterwards drunk in order that the survivors may acquire the qualities of the deceased.

Parts of dead used in subsequent ceremony.

At times fragments of the deceased are used in some subsequent ceremonial, as among the Abipones, where parts of the heart and tongue of the dead are given to a dog to eat. This is done that the author of the death may die also. Among the Sioux it is customary for women to "keep the ghost." A little hair of the deceased is done up in calico until a package is made some two feet in length and ten inches in diameter. This is encased in a hide or blanket and hung between two cross-sticks in front of the lodge. In the lodge a heap of presents gradually accumulates. Men and boys go into the lodge daily and, after smoking, empty the ashes from their pipes into the middle of the lodge, where they must be undisturbed. When they eat they put food under the ghost. Finally the friends are called together, gifts are given, and the ghost being opened, the hair is distributed. The Santals, who burn their dead, ever preserve a few bits of the partly-burned bones, which must be carried finally to the sacred river, where with ceremony they are set afloat in the current to be carried off to the far eastern land from which their ancestors came. Very curious, too, is the way in which fragments of the dead are considered as charms for helping the living. Not a year passes in our own country when some southern negro is not caught robbing a grave in order to get a luck bone. Far more than most people realize, the influence of the dead man lingers on long after his decease, even in the midst of civilization.

Ideas relative to the future life and the home of the soul.

Of course one of the most interesting and important points connected with the dead man is the idea which people hold of the place to which he is gone. What is the future world? How

do souls conduct themselves there? The answer to this is frequently suggested in the funeral rites themselves. Thus among the Karens we find very curious and complex ceremonies. On the day of burial, when the corpse is carried to the grave, four splints of bamboo are taken. One is thrown toward the west, and they say as they throw it, "That is the east"; another is thrown toward the east, saying, "That is the west"; a third is thrown upward toward the top of a tree, saying, "That is the foot of the tree," and a fourth is thrown downward, saying, "That is the top of the tree." The source of the stream is then pointed to, saying, "That is the mouth of the stream," and the mouth of the stream is pointed to, saying, "That is the head of the stream." This is done, because in the hereafter everything is reversed. The Australians believe that all men who are killed or die become white men. They believe that the dead man becomes a white ghost in a country beyond the sea. The whites were, therefore, thought by Australians to be the ghosts of their own dead returned. Sir George Gray was thought to be a returned son who had been speared in a fray. "Yes, yes, it is he," cried the old mother, laying her head on his breast and weeping.

Among the Karens;

Among Australians;

We have already referred to the different places to which the Aztecs went after death. The journey thither was long and dangerous. A little dog was sacrificed for a companion. A hot fire of the garments of the deceased was made to warm him in the cold part of his journey; papers protected him at the dangerous points in his journey. For notice, that he must pass first between two mountains which close and open; then he must walk along a road defended by a great serpent; then he must pass a terrible crocodile; next eight deserts must be traversed; then eight hills climbed; and, lastly, he must pass a district where a sharp wind ever blows which tears up rocks and cuts with its cold blasts as a knife cuts.

Among the Aztecs;

Among the Nicaraguans.

Shortly after the Spanish conquest a Nicaraguan chief, speaking with a Spanish visitor, carried on the following conversation :

Bobadilla—"Where do the dead go?"

Cacique—"The good to the sky with the *teotes;* the bad down into a country underground and frightful."

Bobadilla—"Are they there as here? With body, head, feet, hands?"

Cacique—"No. When one dies something like a person, the *yulio*, goes from the mouth, goes to the home of the man or woman, and dwells there, dying not, while the body remains."

Bobadilla—"Does the body rejoin this 'person' which goes from the mouth?"

Cacique—"No."

Bobadilla—"Who do you think good enough to go to heaven and bad enough to go to hell?"

Cacique—"I consider those who frequent the temples and sanctuaries good: those who do not, bad."

Bobadilla—"When Indians die, what makes them die?"

Cacique—"The *teotes* kill those who serve them not: those who go to heaven do not *die*, although they cease to live here."

But a large book would not begin to suffice to describe the land of the soul as pictured by the lower peoples of the world, and we have already given as many examples as we ought.

Worship of the dead.

Lastly, the dead man may become in time, or with some people, a true object of worship. It is, of course, perfectly natural that his ghost should be feared. Among some people it is quite natural that the memory of the dead parent should arouse respect. At all events, it is certain that in many places one of these motives, or some other, has led to attention being paid to the ancestor. We may see the beginning of ancestor worship among peoples like the New Caledonians, the Santals,

Beginnings of ancestor worship.

the Dahomeyans. The New Caledonians believe that every fifth month the spirits return from the bush. Heaps of food are prepared; the people assemble in the afternoon around the cave; at sundown there is a feast and the speaker addresses the spirits of old men and women in the cave, saying, "Spirits, may it please you to sing a song that all out here may hear your sweet voices?" A song follows. Dancing and orgies are then indulged in. Among the Santals a sacred grove is found near each village. This is the resort of the village gods. From its silent gloom the generations of the past watch the actions of the children of the present. They are, however, critical, dealing out diseases unless appeased. Hence at intervals the villagers in their finest garments worship in the grove; sacrifices are made; and a feast takes place. In Dahomey Burton tells us that the king sends messengers with any news of importance to his forefathers. Delivering the message to any one who stands by, he cuts off his head; should he have forgotten some detail, a second messenger may be instantly dispatched with the forgotten portion.

Developed ancestor worship in China.

From such rude beginnings may in time arise an ancestral worship as peculiar and detailed as we find in China, where the reverence and respect shown to a father during his life-time is continued after death. When important family matters are under advisement the dead man's wishes are consulted by means of divination. Food and gifts are offered for many days and incense burned before the place where the spirit is supposed to hover. With true Chinese prudence, cheap paper copies of the gifts are burned or offered instead of the reality. An ancestral tablet bearing the name of the father or other ancestor is erected and in front of it regular offerings are made and services conducted on the first and fifteenth of each month. On occasions of importance in the family, such as birthday anniversaries or making preparations for weddings, special serv-

ices are conducted, and on certain days of the year it is expected that the ancestors shall be worshiped with elaborate ceremonies.

Thus we see how naturally strange ideas and practices arise regarding the dead man. Theories of death, the disposition of the corpse, after-funeral practices, offerings to the dead, ideas of future life, growth of ancestor worship—all of these give interesting glimpses into primitive psychology.

CHAPTER XXVI.

Custom and Law.

Lower people not uncontrolled.

It is a common idea that savage and barbarous people are without any kind of social order; that theft, robbery, felonies, murder, are matters of constant occurrence. Such a conception is false. There is no people living, probably no people ever lived, in such conditions. There are some peoples among whom there is really no such thing as permanent leadership or official control. Some Eskimo tribes are nearly in such position; some Indian peoples in the far north have no chiefs, no head. The man who is somewhat more successful in the hunt than his fellows, or who is somewhat stronger than they, may have some degree of influence in counsel, or in action may be allowed to assume temporary control. Yet, even among such tribes, we do not find a shocking state of life, but, on the contrary, peace prevails and harmony is not more frequently ruffled than among many peoples who have a strong, developed government.

Two checks on lawlessness.

Among all such populations, two things constantly keep bad men in check. The first is the constant possibility of the more quiet, decent members of the community combining against the man who is arrogant or vicious and quietly removing him; the second is the force of popular opinion. This, after all, is more potent than any other influence. No other people are so much bound down by custom as savages; what has been done by fathers and grandfathers is good to do, whether its meaning is plain or its use apparent. The innovator must be a man of

influence—bold, powerful, aggressive. There are few such; innovators are rarities and every detail of savage life is controlled and governed by custom. Few deviate from the well-marked line of behavior.

Structure of society where woman-right prevails.

We have said but little in regard to the social structure of a community where mother-right prevails. If we examine such communities, we find that everything is controlled by ideas of kinship. The social unit so far as it is evident is the *gens;* the gens, theoretically, consists of all the descendants in the female line, from some old female ancestor, either imagined or real. This woman, all her children, her daughters' children, her daughters' daughters' children, and so on down through the generations, make up the gens. Such individuals bear the same name, they recognize a blood relationship among them, they live in houses together, and frequently occupy the same section of a village; they have duties with reference to each other and with reference to the gens as a whole. Morgan, who studied the structure of the Iroquois Confederacy so carefully, found the gens fully existent among them. It was also the fundamental idea in a great number of North American Indian communities.

The influence of such structure on behavior.

In societies where gentile organization prevails, the gens becomes itself a mighty instrument to maintain peace and orderly conduct. The tribe holds the gens responsible for the acts of every member of it. If one commits a murder, it is the duty of the gens to which the murdered man belongs to retaliate. When blood vengeance thus demanded cannot be wreaked upon the murderer himself, any of his gens may justly be sacrificed. It can be seen how the constant recognition of this fact leads to a strong and powerful restraining influence on every person in the tribe. Among the Haidas a young man had been guilty of insolence or insult to a girl, whose family was well-to-do; the nearest male relative of the

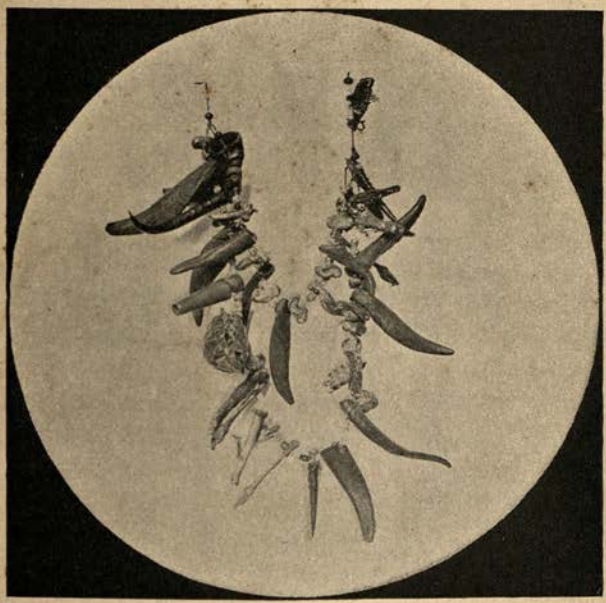

FIG. 32.—KAFFIR SORCERER'S NECKLACE. Africa.

maiden, in order to punish the offender, destroyed a large amount of property of his own. Custom—that is, law—demanded that the young man himself should destroy an equal value of property; but as he did not have any such amount, his fellow gens members were obliged to make up the deficiency, which, of course, was done with no good grace. A man may well be left for punishment to the unpleasant conditions which would certainly prevail in his home after his kinfolk had all been taxed to pay for his lack of prudence.

Thus we see that both in societies with no very distinct organization and in societies where female control and descent prevail there is not that lawlessness and unchecked violence which we might assume. In fact, there might easily be found governments inferior to those of many of our Indian tribes. The Iroquois Confederacy was a marvel. It consisted, ultimately, of six distinct nations, or tribes, each of which was represented in the Great Council of the Confederacy. Each of these tribes had a local government for local interests; each had a council, the membership in which was elective. Representation was by gentes, each gens selecting its own members. The council of the Confederacy was patterned after the council of the tribes and consisted of members elected from each tribe. In the council meeting all matters of importance to the Confederacy were discussed and the representative of every tribe had the power of negativing the action voted by all the others. After a matter had been fully presented to the council the representatives from each tribe withdrew and discussed the matter from the point of view of their own tribe. If here a single member objected to the action planned, it necessitated a negative vote from the full representation of the tribe to which he belonged; but a negative vote from one tribe settled the matter adversely, no matter if the other five believed it advisable. It can easily be seen that a man would think long

The Iroquois Confederacy.

before allowing his personal interests and personal opposition to block decisions of importance.

We are in the habit of thinking of democracies as being necessarily the crowning, final form of government. As a matter of fact, there was nothing but democracies in North America when it was discovered by the white man; and also, as a matter of fact, a democratic government is a simpler, less developed form in some ways than a monarchy.

The Mexican Confederacy.

The statement that only democracies existed in North America at the time of the discovery may surprise some readers. All of us have heard much of the mighty Aztec Empire and of the Mexican Montezuma—its ruler. But Montezuma was only the head war chief of a confederacy of three Indian tribes. What has been said of the Iroquois Confederacy will assist us to understand this structure.

The local government of the Aztecs.

The whole governmental organization was based on kin. Mexico City was a great pueblo not unlike—not totally unlike—the pueblos in Mexico to-day. When this pueblo began, the little tribe of the Aztecs, much reduced in numbers, consisted of but four gentes. Thus the new town was subdivided into four quarters, on a gentile basis. As the tribe throve it grew; gens after gens became unwieldy and divided into new gentes until at last there were about twenty of these, still grouped into the four quarters, which might now be called, properly enough, phratries. Each of the four quarters of the city had considerable independence in local affairs; each had its own god, religious house or temple, and governmental house; each had its council with executive officers. The council was based on kin and each gens had representation. The four quarters together made up the town or tribe. The affairs of the tribe were decided and controlled by the council of the tribe which represented all the quarters and their subdivisions. It did not interfere with the affairs of individual gentes,

but decided matters in dispute between gentes and dealt with outside affairs. In functions it was at once directive, arbitrative, and judicial. Its presiding officers were the *Foreman in Council* ("the wise old man") and the *War Chief* ("big warrior"). So far we have pure tribal government.

The Confederacy; its structure.

Now, when the Aztecs gained in strength and power they united with such neighbors as they could not crush into a confederacy which finally extended its sway over a wide region. The two tribes with which they united were the Aculhuas of Tezcoco and the Tecpanecas of Tlacopan. The union was chiefly for conquest. Matters of confederate interest were considered and decided by a council of the Confederacy; this was representative, comprising members from Mexico, Tezcoco, and Tlacopan. The "*Chief of Men*" was the elected executive officer of the Confederacy. He represented it in all foreign affairs and possessed great though delegated power. He could be deposed for cowardice or other good cause. It was this Chief of Men who is commonly called the Emperor of the Aztecs; it was he who as Montezuma II. met Cortez. He is best called the great war chief of the Confederacy. There was a second great dignitary in the city of Mexico, the *cihua-coatl*, or "snake woman." Elected by the council for life, or during good behavior, he was the supreme judge, voicing the decisions of the council. When the Chief of Men led the confederate forces, the snake woman was at the head of the Aztecs; he was the *tribal* war chief. The terms of the Confederacy required that its great war chief should always be an Aztec. Either of the three tribes might wage independent warfare, and all of them enjoyed independence in local government. Gains secured by confederate action were divided according to set rules of partition—two fifths to Mexico, two fifths to Tezcoco, and one fifth to Tlacopan. This curious confederacy, a masterpiece of barbarous politics, deserves careful study; it shows

what firm concentration of power and consolidation may be secured even in purely tribal society. Morgan and Bandelier have shattered romantic ideas of the "Empire of the Montezumas," but have brought clearly to view something far more interesting.

Property among lower peoples.

A most important matter among ourselves is property. Primitive ideas regarding property are markedly different from our own. At first, but few things were looked upon in the light of *personal* possessions. What a man wore was his; his weapons and his tools were personal. What he killed when hunting was only partly his; his kindred and, in fact, the whole community to which he belonged had their rights in regard to it. Some of the rules and ideas in regard to game which occur among the Eskimo illustrate this matter well and are exceedingly interesting. Hospitality is everywhere among ruder people not a virtue but a natural and necessary quality. Those closely related by blood, of course, are entitled to their share; but so were all the gens members; so was all the village; so was every stranger who might come. In the olden days, before they were affected by the white man and before that greed of gold and avarice which the white man ever teaches, the children of nature was aroused in their hearts, a whole village or tribe of Eskimo might starve to death, but a single individual, never.

Personal property.

Land.

As for land, it was the property of the tribe. It was common property, to be used in any way desired, but chiefly as a hunting-ground. The limits of the tribal territory were well defined. Trespassers upon it might be killed immediately. Wandering from it was likely to bring the vengeance of neighbors upon the wanderer. When agriculture began, those who wished to cultivate the soil would be allowed the use of a sufficient plot out of the tribal stock; it was his so long as he cultivated it; on his neglect it reverted to the tribe and might be

assigned to another. This was the form of land tenure found among all North American Indians who practiced agriculture. The idea of personal ownership of land was no more thought of by most Indians than personal ownership of village springs, of forests, or the air itself. Little by little these primitive notions of property and ownership disappeared, replaced by other and, to our conception, higher views.

Land tenure of the Aztecs.

Bandelier has fully studied the land tenure of the Aztec Mexicans. As it finely illustrates the whole conception of land property among well-advanced barbarians, a brief summary of his views follows: When the Aztecs first settled in the valley of Mexico, the area occupied was the tribal territory; the houses and gardens of each quarter were held by the quarter as a unit; tracts of land for cultivation were set apart for each family. At the beginning there were four of these great subdivisions of the tribe and of the territory. With growth these were subdivided. Each sub-quarter, although governmentally part of the old quarter, was the owner of its own land. The persons living in each sub-quarter were kin and owed each other gentile help and service. If any man could not work his own land on account of official duties or public service, his allotment was worked for him by his kin. In each little district the council of old men—a truly representative body—selected one man, the "elder brother," who, among other duties, attended to the assignment of the plots of land, or *tlalmilli*. A plot was assigned to every married man, for himself and his family; if he neglected to cultivate it for two consecutive years it reverted to the group and could be reassigned. A plot held by a father went, on his decease, to the eldest son for the benefit of the family. When the Aztecs became conquerors they set apart a portion of the conquered land to be worked for their benefit, as tribute producing land. There were thus several kinds of land recognized. First of all

was the territory, the tribal domain; there were then the parts of it, the land of the gens or sub-quarter; this was subdivided into *tlalmilli*, or garden patches for individual use; there were also lands set apart for working for benefit of officers and those employed in tribal service; lastly, there were tribute lands in other territories yielding tribute crops to the government. Nowhere was there an idea of land owned absolutely by an individual.

Personal property in Old Mexico.

As to other property, Aztecs had such, of course, but there was little of our idea of personal accumulation of great wealth. Moreover, what a man did acquire in his life-time was usually burned with him at his decease or buried in his grave.

Moral codes vary.

Moral codes vary infinitely. We have our ideas of right and wrong; most barbarians have just as definite conceptions of right and wrong but sometimes markedly different from our own. We pretend to teach that taking property of others is wrong; the savage or barbarian would think it wrong for others to take his property, wrong for him to take the property of a fellow tribesman, but not wrong for him to take what belongs to a man of another tribe. It is probable that among ourselves it would invariably be admitted that to kill a man intentionally and not as an act of warfare, would be wrong; that to kill the parent would be heinous. Yet, there are ruder peoples where ideas of right and wrong are excellently developed who believe that duty demands that sons should kill their parents. Nor judged from their standpoint is the thing aught but commendable. Such people commonly believe that as a man is when he dies, so will he continue to be throughout the future life; if he be blind or deaf or weak with age, he is bound to continue the same in the world beyond the grave. Of course, where such a belief forms a genuine part of the life nothing could be sadder than for men to live beyond their prime; nothing could be more truly the duty of a son, who had

his father's real interest at heart, than to kill him at that time, to secure his future happiness. A thorough comparison of codes of ethics among primitive folk still remains to make. It would be interesting and most instructive.

We have considered a few of man's achievements. We have seen how he has subdued nature and made fire his servant; how he has supplied himself with food and has devised means for preparing it to advantage; how he has learned to make tools and weapons; how he has improved the plants and animals that nature supplied him; how he has developed the clothes he wears and how they have developed him; how he has housed himself and learned to transport himself. We have traced the history of his modes of expressing thought, and of transmitting the thought of to-day to the generations to follow. We have seen how he reasoned about the world around him, and have glanced at his crudest thoughts in the direction of religion and government. When we consider the progress that he has made, we look forward justly with hope to the progress that lies before.

APPENDICES.

APPENDIX A.

What is Anthropology?

[The chapters in this little book deal with but one of the several great subdivisions of the science of anthropology, viz.: Culture History. It has therefore been thought well to give here a sketch, which shall show somewhat fully the scope and field of the whole study. Accordingly we reprint from *The Chautauquan* for April, 1894, the article "What is Anthropology?"]

In no other science probably is there so much indefiniteness in terminology as in anthropology. The word anthropology itself is used with several different meanings, and the names of the subordinate sciences usually considered as comprised within it are variously applied. We cannot in this article attempt to bring order out of this chaos: we can only try to show what subjects the anthropologist studies and how they are related to each other.

Taken as it stands, looking only to its etymology, *anthropology* means a discourse upon man. The great Frenchman, De Quatrefages, says: "The word anthropology signifies the history of men, as mammology means the history of mammals, as entomology means the history of insects; rigorously it ought to be taken in the same way." "It includes the external description, the comparative examination of the internal organs and that of the functions, the study of the variations, which the fundamental type presents, of instincts and of habits." "The anthropologist, in treating of the various

human groups, has not only to occupy himself with the physical man; the intellectual man, the moral man, demand on his part an equal attention."

Broca called anthropology "the natural history of man," and held that one must study structure, function, habitat, conditions of existence, faculties, instincts, mode of life, migrations, industries, societies. These French writers give much the same scope to the word that Dr. Tylor does in his admirable little work, "Anthropology." In his treatment of the subject he first considers man's age and origin; he then describes and geographically locates the races of mankind; then after studying language and its relations to race he passes to a study of culture history in a series of chapters upon Arts of Life, Arts of Pleasure, Science, The Spirit World, History and Mythology, Society.

Dr. Brinton in a recent pamphlet, "Anthropology as a Science and as a Branch of University Education," takes a similar view. He says: "The study of man, pursued under the guidance of accurate observation and experimental research, embracing all his nature and all manifestations of his activity, in the past as well as in the present, ... is anthropology."

We have gone quite fully into these quotations because to some the word is not so comprehensive; many writers would limit anthropology to a study of the physical man. In this article the word is used in its more general sense.

In a science comprehending so much, subdivision of the field is necessary and the subordinate fields should be carefully separated and characterized. But here we find serious confusion. There are at least four divisions, but the names applied to them vary greatly. Perhaps the most commonly accepted names for these four divisions are physical anthropology, ethnology, ethnography, archæology. We must consider each of these in some detail.

Physical anthropology is called somatology by Brinton; Topinard would use anthropology or general anthropology as its equivalent; man as an animal, a living thing, is the object of study. There are two distinct ways in which man may be considered in somatology. What is his position in the animal series? What amount and kind of variation does he present? To answer these two questions man's anatomy and physiology are carefully investigated. Not only must he be studied in health but the lessons of disease must be learned. Not only normal but abnormal man must be examined. Man is a mammal. He has the same type of structure as other mammals; his organic systems are the same as theirs and they perform the same functions; his embryology is of the same type. Where in the group must he be classified? The anthropologist is interested in the answer.

He studies the form, size, position, and relation of every bone; he examines the shape, development, and attachment of every muscle; he measures the skull in a hundred directions; he weighs the brain and follows its every convolution and sulcus; the viscera are scanned, the blood subjected to microscopical examination, the digestive fluids analyzed, all to find out what sort of an animal man is and who are his nearest brute relatives.

But more—has he the same diseases as they? Do pestilence and sickness show him to be truly flesh of their flesh? And again, what does his embryology show in this direction? How does his fœtus compare with that of his brute neighbors? What are monsters and *freaks*—such as hairy men, albinos, small-headed idiots? Each has its lesson, and a most interesting lesson it is. And after all this has been done, it is still the province of somatology to study the amount of variation in the human species. The whole field must be traversed again but instead of comparing man with the anthropoid ape we

compare man with man. Are the anatomy, physiology, and pathology of groups of men, far separated geographically, subject to variations, and if so what is their extent? Are there races of mankind, and if so how must they be distinguished?

In pursuing these lines of investigation special methods must be followed. The characters studied are of two kinds—those capable of instrumental measurement and those which can only be more or less accurately described—anthropometric and descriptive characters. For taking the former special instruments have been devised. Peculiar forms of compasses, sliding rules, machines for measuring angles and for taking projections, elaborate devices for drawing outlines suitable for after-measurement and study, are in the outfit of an anthropological laboratory. Descriptive characters are difficult of accurate statement, as a personal element is likely to enter in. Hence series of careful directions are prepared for the student, scales of standard colors are issued, diagrams of type forms are printed, so that a careful observer closely following set rules should be able to accurately describe an individual whom he studies.

Every one knows how these methods of study are applied to the criminal. *Criminal anthropology*, so called, is based upon the examination of criminals by anthropological methods. The men in our jails and prisons may be readily identified after their anthropometric characters have been taken by instruments and their descriptive characters have been secured by comparing their hair and eyes, their features and bodily form, with standard scales of colors, and sets of type diagrams. Busy as they have been, however, the criminologists have hardly yet demonstrated a criminal type. As yet we scarcely know what non-criminal man's type may be. Can we know abnormal man's characteristics until we know the normal man?

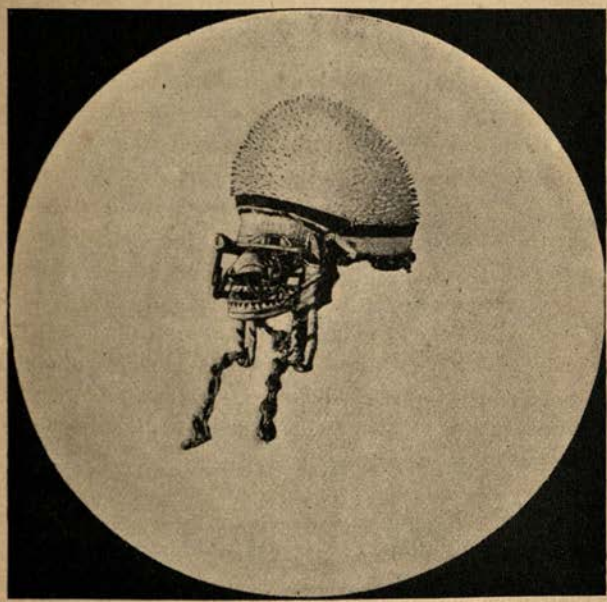

FIG. 33.—DANCING MASK. New Britain Archipelago.

Many great general questions grow out of somatology. There are fields of research yet to be worked. What, if any, influence has environment on man? Can a race take possession of a new continent and thrive in its novel conditions? Why do some races flourish, while others are dying out? Do children inherit acquired traits or character from their parents? Can we, as Galton would have us, improve the race by purposive selection in marriage?

A second division of anthropology is what is commonly called *ethnology:* Brinton calls this *ethnography;* Topinard calls it *special anthropology* and *general ethnography.* It concerns itself with the idea of race and races. It investigates the origin of races and assails the problem of the unity of man. This is the much discussed question of *monogenism and polygenism.* Is there one species of man or more? Are all men brothers, or are we only collateral descendants of a non-human ancestor? The question is a ghost that will not be laid. Time and again scientific opinion has swung first to one side and then to the other. Ethnology also studies the races of the present; it attempts to describe and classify them; it seeks to find relationships; it endeavors to trace back lines of migration, followed by moving populations.

The term *ethnography* as generally used includes the description of the life, customs, languages, arts, religious beliefs, etc., of peoples. Brinton calls this *ethnology* and Topinard calls it *special ethnography.* This is perhaps the most generally popular branch of anthropology. Every one lingers in front of cases of curious objects brought from ruder peoples and all delight to read books wherein are described the life and ways of outlandish folk. Yet relatively little good ethnographic work has been done. A good observer should note every detail: how do the people dress; what ornaments do they make; as to houses, how are they constructed, located, considered; what

furniture; how is food prepared; what implements of fishing, hunting, agriculture, domestication; what arts pursued; what is the grammatical structure and the word-content of the language; what of writing; what of history and tradition; governmental and social organization; what of religion and superstitious ideas? Few books in our language answer all these questions for any people. Books like Nansen's "Eskimo Life," Batchelor's "Ainu," and Doolittle's "Social Life of the Chinese," are very rare. But before ethnography will have its fullest value we must have such books concerning every people.

Ethnographic museums are common in Europe. The oldest probably is that at Copenhagen; probably the most extensive is that at Berlin; but there are such collections in every great city and in many small towns. In this respect America is far behind; at Boston, Salem, New York, Philadelphia, Washington are good collections, or at least good beginnings. Chicago will no doubt have much ethnographic material of value in the Field-Columbian Museum. In all such collections complete series of objects representing every phase of life in fullest detail are desirable. Odds and ends, curios, series of choicest masterpieces of foreign art are not valuable scientific material.

A fourth subdivision of anthropology commonly recognized is *prehistoric archæology*. It deals with those material relics which men of the olden time have left behind. Nowhere better than in Western Europe has it been cultivated. What a wonderful story it has told! Primitive man, the contemporary of the mammoth and of the woolly rhinoceros, chipped his flint tools while glacial conditions still prevailed over Northern Europe. Later we find him using delicately chipped or finely polished implements in varied form and made of many kinds of rocks. We see the use of metal gradually spread and dis-

tinguish an age of bronze and a later one of iron. This in Europe. But in America, too, we have a great and interesting field for study. Far too superficial work has been done here in many cases. But it may be that finally here, too, we shall bring order out of the present confusion. Here are shell-heaps, old village sites, mounds and earthworks, ruined villages in Central America, Yucatan, and Mexico, old pueblos and cliff-houses in the Southwest. These must tell their stories of old-time life and custom, of migrations, of religious beliefs; from these we must trace the growth of arts and inventions step by step.

Culture history might be separated from all the preceding as a subdivision of anthropology, or it might be included in archæology and ethnography. We can trace the growth of an art idea by the help of archæology. But we may also trace the same growth in another way. In the march from savagery to civilization all peoples have not traveled at the same speed; some have hardly traveled at all. Belated tribes exist, who represent almost every stage of culture. When we have secured our full series of specimens from every tribe, we may trace a thousand lines of invention or of art by comparison of specimens.

In the Pitt-Rivers Museum at Oxford the attempt to illustrate the history of culture in this way is carried out. What is the history of the gun? Here you may see it represented in full detail. The art of pottery, one of man's oldest arts, is very interesting and it is not difficult to collect, even now, from various peoples a series of specimens which shall tell the story of its growth. The history of written language and the development of the alphabet can be reconstructed by a critical study of the written languages of the world to-day. When we compare the cultures of different peoples and of different times, we gain the best possible understanding of our own time and our

own surroundings. Some unmeaning ornament upon a vase may become pregnant with meaning when compared with the crude pottery of some rude tribe; a strange custom in our society may become illuminated, when we learn the social ideas of a lower people; some hampering superstition finds significance and loses force, when we look into the religious notions of a savage.

Such is our subject! "Broad!" Yes. "Indefinite!" No. It deals with forms and structures of society, but it is not sociology; it deals with arts and industries, but it is *not* art or technique. Anthropology, by study of primitive communities and by tracing the development of social organisms, lays a broad and sure foundation for scientific sociology, but it does not grapple with labor problems or penitentiary reforms. The anthropologist may measure criminals, but he does not make laws. Anthropology may include within its objects of study a basket or a pot, it may investigate the pictures rudely painted on a cliff, or strive to reproduce the almost vanished scratches upon a bit of bone or antler; but it does not found a pottery, or study light and shade, or criticise a Rubens.

Upon the Anthropological Building at Chicago we read the inscription, "*Man and His Works.*" In anthropology when we study man's works, it is not for themselves, but only as in them man himself is reflected. Only as a man's mind is revealed in products do we care for them. Nor is it particularly the idea of one man that we seek, but that of the race; not the progress and the victory of the individual, but of all mankind.

How can a man deal with his fellow-man without such knowledge? What would seem more natural as a preparation for a life of usefulness than study of one's kind? Men and women go forth, year after year, to work for others—as physicians, lawyers, preachers, missionaries, teachers. They go in absolute

ignorance of the material they are to work with, often with no knowledge even of the physical nature of mankind. With no conception of man's past, they try to mold his future! Without a thought as to his origin, they endeavor to show his destiny! Not knowing religion, they would teach a creed! Ignorant of normal development, they attempt their ill-advised reforms and crush a race. Where else is there such an anomaly? Do men go from our technical schools to practical work in electricity with no knowledge of cells and batteries, wires and insulation? Do veterinary surgeons graduate without having studied the anatomy of a horse? But teachers, preachers, missionaries, and other "leaders of mankind" go forth to work their fields as ignorant of what mankind really is as a field geologist could afford to be of the life of Xerxes.

The study of mankind by scientific methods is recent. Anthropology is a science of this century, almost of its latter half. It has had to fight its way to recognition—nay, still *is* fighting. Europe is awake. In 1834 the Ethnographic Museum at Copenhagen was established—the first in the world; we have seen how they have sprung up since. In 1859 the *Société d' Anthropologie de Paris* was founded; such societies now exist in every European country and a few have been established in America. In Europe most of the universities have at least one teacher in some line of anthropological work. In America fifteen years ago probably there was not one institution where the subject was taught. Professor Gilmore at Rochester and Sir Daniel Wilson at Toronto were veritable pioneers in the field. To-day it is taught in several of our larger universities and in about as many smaller but progressive institutions. Last year for the first time a separate building of a World's Exposition was given up to anthropology. These are signs of the times. We are beginning to realize that man's proper study is mankind. Anthropology is claiming its rank among the sciences.

APPENDIX B.

Sign Language in Print.

In *Science* for May 26, 1893, I called attention to a rather interesting phase of gesture language under the above title. As all readers may not have access to the original reference the paper is here reproduced :

Mr. Lewis Hadley of Chicago is at present engaged upon a plan for reducing the sign language to print. The purpose of the work is benevolent and religious, the idea being to bring religious instruction to the old Indians. It is well known that old Indians will never learn to read our language. It is believed by Mr. Hadley and his friends that they will quickly learn a printed sign language. Of course, all these old men make constant use of gestures and signs ; and, if they take kindly to the printed gestures, there is no question that considerable progress might be made.

Mr. Hadley has had difficulties to contend with in carrying out his work. He has been hampered by the lack of funds and by the novelty of the undertaking. In his first experiment he cut the dies for printing himself, and the resulting impressions were black designs with the figures in white lines, and the result was exceedingly ugly. He has since then simplified the designs and made them in the form of ordinary type, and has now an extensive font of several thousand types, which will be used in printing cards and tracts for the instruction of the Indians.

There are two points to be considered in reference to this plan: first, its feasibility; second, its methodology.

There are three questions that arise in reference to feasibility:

1. Is there a universal sign language among the Indians?

2. Can the signs be represented by type?

3. Will the Indians care to learn it?

1. As regards the first of these, Mallery says there is no absolutely fixed sign language in general use among the Indians. While this is true, it is also true that all Indians gesture, and the gestures are so natural and so self-expressive that there is no question that natural signs, although new, would be generally understood.

2. There is, of course, a difficulty in representing the gestures by type so that they can be readily recognized. This difficulty all who have attempted to work in the subject of gesture language realize. Mr. Hadley has changed the forms of his type repeatedly. He has produced finally what appear to be simple, plain, and easily understood characters. Many of these may have to be still further changed, but in large measure they meet the requirements.

3. There is a very serious question as to the favorable reception of this printed gesture language by the Indians themselves. It is, however, in a certain sense, picture-writing, and picture-writing is natural to the North American. Mr. Hadley is doing, on a large scale and at one stroke, what the Indians have begun to do in many cases. Lieutenant Mallery has shown in his papers the close relationship between gesture language and pictography. The picture character is often only an attempt to represent a gesture. This being so, it may be possible that a kind reception will be given by the Indians to the printed sign language.

As to the method of introducing the printed sign language into use, Mr. Hadley has devised a game of cards, which, he

believes, will help greatly in the work of teaching. Each card has upon its face, in unusually large type, a gesture. Upon its back is printed the English equivalent for the gesture. The game to be played with these cards is based upon certain gambling games, already quite familiar to the Indian, and success in the game depends upon the Indian giving the English word for the sign represented. All games of an instructive kind are more or less of a nuisance, but it is not impossible that these cards may be successful in the way they are intended. Besides the game of cards, the purpose of which is really to teach the speaking and reading of English through the printed sign language, a considerable number of texts, mainly of a religious character, are to be issued. It is expected that an Indian who has a story or a passage printed in the sign character will himself make the signs represented, and by making the signs he will gain the idea to be conveyed.

Every text of the sign type has under it the English equivalent in words. In order to convey an idea of what this test is like, I present herewith a line of the text as it appears in print.

It will be seen that, quite apart from its religious and educational purpose, this matter is one of scientific importance, and we shall watch with interest how far it may succeed.

APPENDIX C.

List of Books for Reference.

The author recommends the following books for further reading and study. Personally he is particularly indebted to the various books of Edward B. Tylor. He also has received much assistance from the works of Sir John Lubbock, Lippert, Letourneau, and Spencer. The list does not pretend to be full, but comprises chiefly books that can be readily found in libraries or easily procured.

Tylor: *Anthropology.*

Tylor: *Primitive Culture.*

Tylor: *Early History of Mankind.*

Lubbock: *Origin of Civilization.*

Lubbock: *Prehistoric Times.*

Lippert: *Kulturgeschichte.*

For many papers of value by Hough, Cushing, Mason, Mallery, Hoffman, Holmes, Dorsey, Powell, Matthews:

Annual Reports of Bureau of Ethnology.

Annual Reports of Smithsonian Institution.

Annual Reports of United States National Museum.

Andree: *Anthropophagie.*

De Mortillet: *Origines de la Chasse, etc.*

De Candolle: *Origin of Cultivated Plants.*

De Mortillet: *Le Prehistorique.*

Joly: *Man Before Metals.*

Flower: *Fashion in Deformity.*

Schurtz: *Philosophie der Tracht.*

Brinton: *Races and Peoples.*
Brinton: *Essays of an Americanist.*
Brinton: *American Hero Myths.*
Brinton: *The American Race.*
Whitney: *Life and Growth of Language.*
Isaac Taylor: *The Alphabet.*
Isaac Taylor: *The Origin of the Aryans.*
Fiske: *Myths and Myth-makers.*
Andree: *Die Metalle bei den Naturvölkern.*
Balfour: *Evolution of Decorative Art.*
McLennan: *Studies in Ancient History.*
Morgan: *Ancient Society.*
Lefevre: *Race and Language.*
Mason: *Woman's Share in Primitive Culture.*
Darwin: *Animals and Plants under Domestication.*
Starcke: *The Primitive Family.*
Spencer: *Principles of Sociology.*
Spencer: *Descriptive Sociology.*

NOTE.—On pages 80 and 81 an error is made. The cabbage, cauliflower, Brussels sprouts, etc., are one species; the variation is due to man's cultivation. The turnip is a related, but different, species.

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